



DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R1-ES-2020-0060; FF09E22000 FXES11130900000 234]

RIN 1018-BE72

Endangered and Threatened Wildlife and Plants; Removing Golden Paintbrush from the Federal List of Endangered and Threatened Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), remove the golden paintbrush (*Castilleja levisecta*) from the Federal List of Endangered and Threatened Plants as it no longer meets the definition of an endangered or threatened species under the Endangered Species Act of 1973, as amended (Act). The golden paintbrush is a flowering plant native to southwestern British Columbia, western Washington, and western Oregon. Our review of the best available scientific and commercial data indicates threats to the golden paintbrush have been eliminated or reduced to the point that the species no longer meets the definition of an endangered or threatened species under the Act.

DATES: This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF FEDERAL REGISTER PUBLICATION].

FOR FURTHER INFORMATION CONTACT: Direct all questions or requests for additional information to: GOLDEN PAINTBRUSH QUESTIONS, Brad Thompson, State Supervisor, U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, 510 Desmond Drive SE, Suite 102, Lacey, WA 98503; telephone: 360-753-9440. Individuals in the United States who are deaf, deafblind, hard of

hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, if we determine a plant species no longer meets the definition of an endangered or threatened species, we remove it from the Federal List of Endangered and Threatened Plants (i.e., we “delist” it). Delisting a species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process.

What this document does. This rule removes (delists) the golden paintbrush from the Federal List of Endangered and Threatened Plants because it no longer meets the Act’s definition of either a threatened species or an endangered species.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of the following five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. The determination to delist a species must be based on an analysis of the same factors. Based on an assessment of the best available information regarding the status of and threats to the golden paintbrush, we have determined that the species no longer meets the definition of a threatened species or an endangered species under the Act.

We have determined that golden paintbrush is not in danger of extinction now nor likely to become so in the foreseeable future based on a comprehensive review of its status and listing factors. Specifically, our recent review indicated: (1) An increase in the known number of occurrences of the species within its geographic range, and increased abundance in many populations; (2) resiliency of the species to existing and potential threats; (3) 45 of 48 sites with golden paintbrush are in either public ownership; are owned by a conservation-oriented, nongovernmental organization; or are under conservation easement; and (4) the implementation of beneficial management practices for the species. Accordingly, the golden paintbrush no longer meets the definition of a threatened species or an endangered species under the Act.

Peer review and public comment. The purpose of peer review is to ensure that our determination regarding the status of the species under the Act is based on scientifically sound data, assumptions, and analyses. We prepared a species biological report (SBR) for golden paintbrush (Service 2019) and sought peer review on the report in accordance with our joint policy on peer review published in the *Federal Register* on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act. We sent the report to four appropriate and independent specialists with knowledge of the biology and ecology of the golden paintbrush and received three responses. The comments and recommendations of the peer reviewers have been incorporated into the SBR as appropriate, and they informed the proposed rule. We posted the peer reviews on <https://www.regulations.gov> under Docket No. FWS-R1-ES-2020-0060. Furthermore, in our June 30, 2021, proposed rule (86 FR 34695), we requested that all interested parties submit written comments on the proposal by August 30, 2021. We received 10 public comments in response to the proposed rule as discussed below in **Summary of Comments and Recommendations**.

Supporting Documents

Staff at the Washington Fish and Wildlife Office (WFWO), in consultation with other species experts, prepared the SBR for golden paintbrush (Service 2019). The report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past and present factors (both negative and beneficial) affecting the species. The report formed the scientific basis for our 5-year status review and this final rule. The report is posted on <https://www.regulations.gov> under Docket No. FWS-R1-ES-2020-0060.

Previous Federal Actions

On May 10, 1994, we published in the *Federal Register* (59 FR 24106) a proposed rule to list the golden paintbrush as a threatened species under the Act (16 U.S.C. 1531 et seq.). On June 11, 1997, we published in the *Federal Register* (62 FR 31740) a final rule to list the species as a threatened species under the Act. The final rule included a determination that the designation of critical habitat for the golden paintbrush was not prudent.

In August 2000, we finalized a recovery plan for the species (Service 2000, entire), which we supplemented in May 2010 with the final recovery plan for the prairie species of western Oregon and southwestern Washington (Service 2010, entire).

On July 6, 2005, we initiated 5-year reviews for 33 plant and animal species, including the golden paintbrush, under section 4(c)(2) of the Act, and requested information on the species' status (see 70 FR 38972). The 5-year status review, completed in September 2007 (Service 2007, entire), resulted in a recommendation to maintain the status of the golden paintbrush as threatened. The 2007 5-year status review is available on the Service's website at

https://ecos.fws.gov/docs/five_year_review/doc1764.pdf.

On January 22, 2018, we initiated 5-year status reviews for 18 plant and animal species, including the golden paintbrush, under section 4(c)(2) of the Act, and requested information on the species' status (see 83 FR 3014). In 2019, we completed our SBR (Service 2019).

On June 30, 2021, we published in the *Federal Register* (86 FR 34695) a proposed rule to remove golden paintbrush from the List, and we made available our draft post-delisting monitoring plan for public review and comment. Our proposed rule followed from the recommendation of the most recent 5-year review for the golden paintbrush, as well as the data and analysis contained in the SBR (Service 2019).

Summary of Changes from the Proposed Rule

In preparing this final rule, we reviewed and fully considered comments from the public on the June 30, 2021, proposed rule (86 FR 34695) and the draft post-delisting monitoring plan. We updated information presented in the proposed rule based on comments and additional information provided as follows:

(1) We included updated survey information provided to the Service.

(2) We incorporated additional information regarding stressors and potential threats to the species.

(3) We made many small, nonsubstantive clarifications and corrections throughout this rule, including under **Summary of Biological Status and Threats**, below, in order to ensure better consistency, clarify some information, and update or add new references.

We considered whether this additional information altered our analysis of the magnitude or severity of threats facing the species. We conclude that the information we received during the comment period for the proposed rule did not change our previous analysis of the magnitude or severity of threats facing the species or our

determination that golden paintbrush is no longer a threatened species and warrants delisting.

Background

Below, we summarize information for the golden paintbrush directly relevant to this final rule. For more information on the description, biology, ecology, and habitat of the golden paintbrush, please refer to the SBR for golden paintbrush (*Castilleja levisecta*), completed in June 2019 (Service 2019, entire). The SBR is available under Supporting Documents on <https://www.regulations.gov> in Docket No. FWS-R1-ES-2020-0060. The SBR and other relevant supporting documents are available on the golden paintbrush's species profile page on the Environmental Conservation Online System (ECOS) at <https://ecos.fws.gov/ecp/species/7706>.

Species Description and Habitat Information

The golden paintbrush is native to the northwestern United States and southwestern British Columbia. It has been historically reported from more than 30 sites from Vancouver Island, British Columbia, to the Willamette Valley of Oregon (Hitchcock et al. 1959, entire; Sheehan and Sprague 1984, p. 5; Gamon 1995, pp. 5-7). The taxonomy of the golden paintbrush as a full species is widely accepted as valid by the scientific community (Integrated Taxonomic Information System (ITIS) 2020, entire).

The golden paintbrush is a short-lived perennial herb formerly included in the figwort or snapdragon family (Scrophulariaceae), with current classification in the Orobanchaceae family. The genus *Castilleja* is hemiparasitic, with roots of paintbrushes capable of forming parasitic connections to roots of other plants; however, paintbrush plants are probably not host-specific (Mills and Kummerow 1988, entire) and can grow successfully, though not as well, even without a host. Golden paintbrush has superior performance (survival, height, number of flowering

stems, number of fruiting stems, number of seed capsules) where it co-occurs with certain prairie species, including several perennial native forbs (e.g., common woolly sunflower or Oregon sunshine (*Eriophyllum lanatum*) and common yarrow (*Achillea millefolium*)), as well as species in other functional groups, including grasses (e.g., Roemer's fescue (*Festuca roemerii*) and California oatgrass (*Danthonia californica*)) and shrubs (e.g., snowberry (*Symphoricarpos albus*)) (Schmidt 2016, pp. 10–17). Anecdotal observations suggest that golden paintbrush grows poorly when associated with annual grasses (Gamon 1995, p. 17).

Individual golden paintbrush plants have a median survival of 1 to 5 years, but some plants can survive for more than a decade (Service 2019, p. 7). Plants are up to 30 centimeters (cm) (12 inches (in)) tall and are covered with soft, somewhat sticky hairs. Stems may be erect or spreading, in the latter case giving the appearance of being several plants, especially when in tall grass. The lower leaves are broader, with one to three pairs of short lateral lobes. The bracts are softly hairy and sticky, golden yellow, and about the same width as the upper leaves.

Golden paintbrush plants typically emerge in early March, with flowering generally beginning the last week in April and continuing until early June. Most plants complete flowering by early to mid-June, although occasionally plants flower throughout the summer and into October. Based on historical collections and observations, flowering seems to occur at about the same time throughout the species' range. Individual plants of golden paintbrush typically need pollinators to set seed. Bumble bee species (*Bombus*) appear to be the most common pollinators visiting golden paintbrush (Wentworth 1994, p. 5; Kolar and Fessler 2006, in litt.; Waters 2018, in litt.; Kaye 2019, in litt.), although sweat bees (Halictidae), miner bee (*Andrena chlorogaster*), syrphid fly (*Eristalis hirta*), and bee fly (*Bombylius major*)

have also been observed visiting golden paintbrush plants (Kolar and Fessler 2006, in litt.; Waters 2018, in litt.).

Fruits typically mature from late June through July, with seed capsules beginning to open and disperse seed in August. By mid-July, plants at most sites are in senescence (the process of deterioration with age), although this can vary considerably depending on available moisture. Capsules persist on the plants well into the winter, and often retain seed into the following spring. Seeds are likely shaken from the seed capsules by wind, with most falling a short distance from the parent plant (Godt et al. 2005, p. 88). The seeds are light (approximately 8,000 seeds per gram) and could possibly be dispersed short distances by wind (Kaye et al. 2012, p. 7). Additionally, there is at least one reported instance of short-distance movement of seeds via vole activity (Kolar and Fessler 2006, in litt.). Therefore, natural colonization of new sites would likely occur only over short distances as plants disperse from established sites. Germination tests in different years with seed from various populations suggest that germination rates can vary extremely widely both between sites and between years (Wentworth 1994, entire). Germination tests also revealed that seeds likely remain viable in the wild for several years (Wentworth 1994, p. 17).

Individuals of the golden paintbrush require open prairie soils, near-bedrock soils, or clayey alluvial soils with suitable host plants. These suitable habitats occur from zero to 100 meters (330 feet) above sea level (Service 2000, p. 5). The golden paintbrush may have historically grown in deeper soils, but nearly all of these soils within the known range of the species have been converted to agriculture (Lawrence and Kaye 2006, p. 150; Dunwiddie and Martin 2016, p. 1). Reintroduction efforts have targeted sites or microsites, with features such as mounds or swales and deeper

soils where these efforts were more likely to be effective (Dunwiddie and Martin 2016, p. 15).

Populations currently occur on the mainland in the States of Washington and Oregon, and on islands in the State of Washington and in British Columbia, Canada. Mainland and island populations form two broad categories of populations that can vary slightly in habitat setting. Individuals in mainland populations are found in open, undulating remnant prairies dominated by Roemer's fescue and red fescue (*Festuca rubra*) on gravelly or clayey glacial outwash. Individuals in island populations are often on the upper slopes or rims of steep, southwest- or west-facing, sandy bluffs that are exposed to salt spray. Individuals in island populations may also occur on remnant coastal prairie flats on glacial deposits of sandy loam. Island prairies may have historically been dominated by forbs and foothill sedge (*Carex tumulicola*) rather than grasses (Washington Department of Natural Resources (WDNR) 2004b, pp. 11, 17); however, many island sites are now dominated by red fescue or weedy forbs. All golden paintbrush sites are subject to encroachment by woody vegetation if not managed.

Historically, fire was significant in maintaining open prairie conditions in parts of the range of the golden paintbrush (Boyd 1986, p. 82; Gamon 1995, p. 14; Dunwiddie et al. 2001, p. 162). The golden paintbrush is a poor competitor, intolerant of shade cast by encroaching tall nonnatives and litter duff in fire-suppressed prairies. Native perennial communities are likely to support more host species appropriate for the golden paintbrush than those dominated by nonnative annuals (Lawrence and Kaye 2011, p. 173). Thus, habitats with low presence of nonnative annuals and high presence of a diverse assemblage of perennial, native prairie species are more likely to provide the best conditions for survival of golden paintbrush plants year-to-year (Dunwiddie and Martin 2016, p. 1).

Range, Distribution, Abundance, and Trends of Golden Paintbrush

The golden paintbrush is endemic to the Pacific Northwest, historically occurring from southeastern Vancouver Island and adjacent islands in British Columbia, Canada, to the San Juan Islands and Puget Trough in western Washington and into the Willamette Valley of western Oregon (Fertig 2021, pp. 33–34).

Currently, the species occurs within British Columbia, Washington, and Oregon, representing, generally, four geographic areas (British Columbia, North Puget Sound, South Puget Sound, and the Willamette Valley). The species' historical distribution—before European settlement and modern development in the Pacific Northwest—is unknown. However, the species' current distribution is generally representative of the areas where we suspect the species occurred historically.

Since its Federal listing in 1997, only one new population of golden paintbrush that was likely extant at the time of listing has been discovered across the species' range (Service 2007, p. 6). All other new populations across the range are the result of reintroductions through outplanting or direct seeding. Seeds used to grow plugs for outplanting, and plant stock for seed production, were derived from populations that were extant at the time of listing (referred to as “wild sites” in the SBR and other documents) (Service 2019, p. 5). Please note that in previous Service documents (Service 2000, Service 2007, Service 2019), the terms “site” and “population” were used interchangeably. For the purpose of this document, we will use “population” to be more consistent with how the data have been reported over time (Fertig 2019, pp. 11–38).

At the time of listing (see 62 FR 31740; June 11, 1997), there were 10 known golden paintbrush populations: 8 in Washington and 2 in British Columbia. No golden paintbrush populations were known from Oregon at the time of listing (Sheehan and Sprague 1984, pp. 8–9; WDNR 2004b, p. 2). Despite its limited

geographic range and isolation of populations, the golden paintbrush retained exceptionally high levels of genetic diversity, possibly because there were several large populations that remained (Godt et al. 2005, p. 87).

Since its Federal listing, the distribution and abundance of golden paintbrush have increased significantly as a result of outplanting (seeding or plugging). During the last rangewide assessment, a minimum of 48 populations were documented (Service 2019, pp. 11–14). Based on these data, in Washington, there are 19 populations: 5 in the South Puget Sound prairie landscape, 6 in the San Juan Islands, 7 on Whidbey Island, and 1 near Dungeness Bay in the Strait of Juan de Fuca. In Oregon, there are 26 extant populations within the Willamette Valley. In British Columbia, there are three extant populations, each located on a separate island. Of these 48 populations, only 3 are on private property (Service 2019, p. 12). The remaining 45 golden paintbrush populations are in either public ownership; are owned by a conservation-oriented, nongovernmental organization; or are under conservation easement.

Current Distribution of Golden Paintbrush Populations

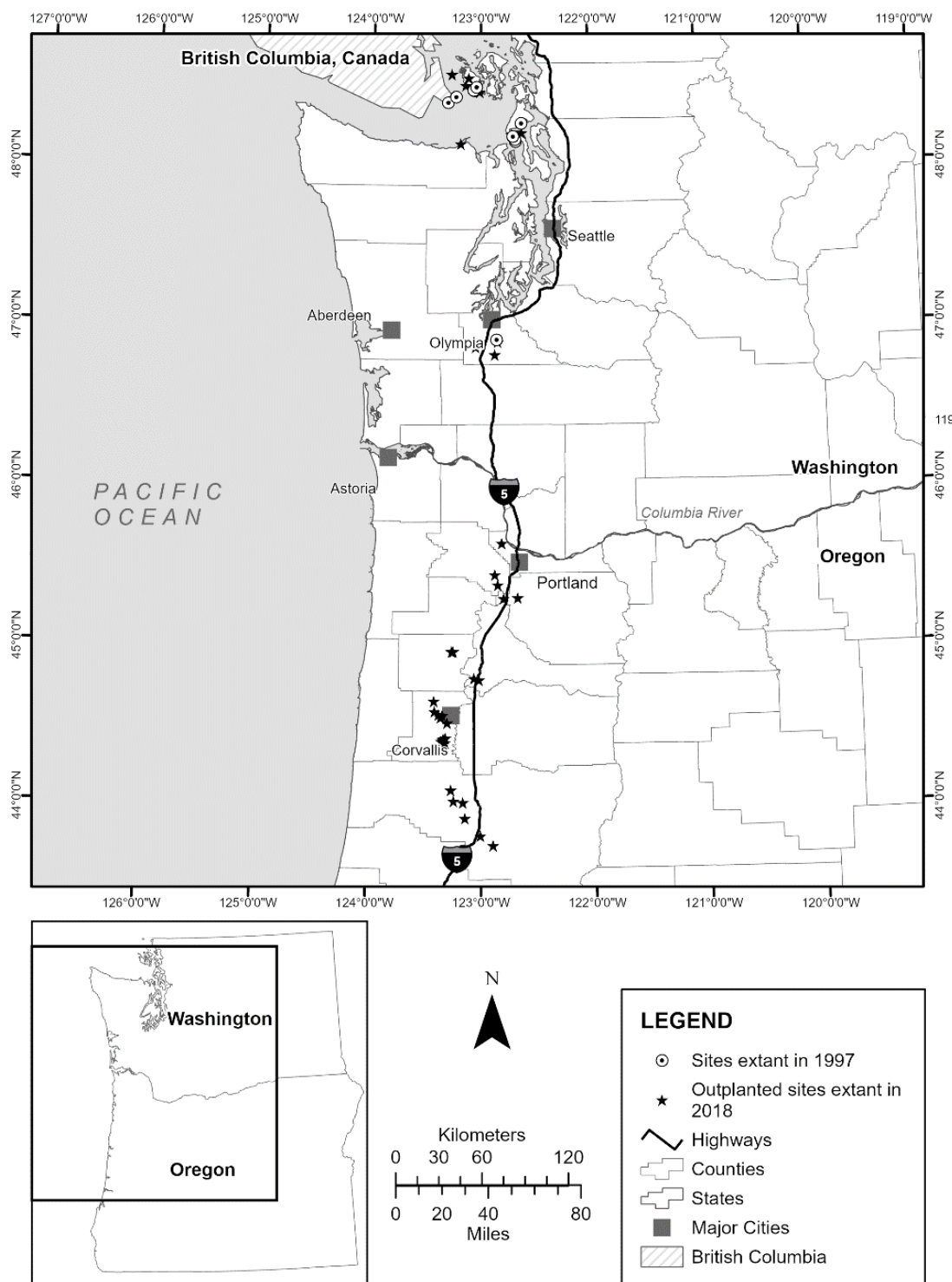


Figure 1. Extant sites (“populations”) of golden paintbrush across the species’ known range.

Trends in abundance for the golden paintbrush have been consistently monitored since 2004 (Fertig 2021, pp. 11–38), with refinements to monitoring

protocols made in 2008 and 2011 (Arnett 2011, entire). Rangewide abundance has substantially increased from approximately 11,500 flowering plants in 2011, to more than 560,000 flowering plants counted in 2018 (Fertig 2021, p. 22). In 2019, the number of flowering plants declined to 325,320 (Fertig 2021, p. 22). Although this appears to be a drop in abundance, we attribute the rapid increase in abundance in 2018 to the development of direct seeding techniques for establishing new populations, as opposed to outplanting individual plants (or plugs) grown in greenhouses. Most of the populations in Washington and Oregon's Willamette Valley were established by incorporating direct seeding. The 2018 rangewide population abundance was not necessarily reflective of the eventual long-term population level at a site. A number of reestablished populations have been going through a period of prairie development/progression and species succession. For example, at some reestablished populations, abundance initially increased over several years then dropped to about 15–20 percent of the peak abundance (Fertig 2021, pp. 23–27). Drops in abundance are somewhat expected as the populations experience variability after direct seeding, and we anticipate that long-term population levels at these reestablished sites will meet recovery criteria.

In 2020, there was a reduction of survey effort due to limitations related to the COVID pandemic, and while the majority of populations were surveyed consistently in Washington, 25 populations in Oregon were not surveyed. The last 4 years of monitoring rangewide (2017–2020) represent the 4 years with greatest abundance, even without data from the 25 sites in Oregon that were not monitored in 2020 (Fertig 2021, p. 14). The year 2020 also represents the second highest abundance of golden paintbrush in the State of Washington at 202,208 flowering plants, which was a 47.8 percent increase from 136,846 in 2019 (Fertig 2021, p. 11).

In contrast to the newly established golden paintbrush populations (referred to as “outplantings”), there has been a steady decline in overall abundance of the populations extant at the time of listing since 2012. Abundance at these populations dropped from just over 15,500 flowering plants in 2012, to 2,223 flowering plants in 2020 (Fertig 2021, p. 11)

The Service considers the demographics and site conditions of all golden paintbrush populations across the species’ range when determining the status of the species, including populations extant at the time of listing, as well as new populations outplanted since the time of listing. In past Service documents, the sites with populations extant at the time of listing have often been referred to as “wild” sites, and trends of abundance have been tracked separately from outplanted populations (see Fertig 2021, p. 14, and Service 2019, p. 30). Because seed from many of the populations extant at the time of listing was used to establish populations across the range, all outplanted populations have representation from original source populations, though the outplanted populations have increased genetic diversity from their source populations due to mixed-source production beds (St. Clair et al. 2020, p. 590). While declines in abundance have been occurring steadily in the populations extant at the time of listing, we do not believe these sites should be considered “wild” or different from outplanted populations, as many have been managed and/or augmented over time and many share genetics with the outplanted populations. Success of golden paintbrush outplantings has been associated with microsites with deeper soils and high richness of native perennial forbs (Dunwiddie and Martin 2016, p. 1); these microsites were likely where golden paintbrush persisted historically, but many of these were tilled for agricultural purposes or developed. Many of the golden paintbrush populations extant at the time of listing may represent marginal or less optimal remnant habitats or sites that were not suitable for other uses (Dunwiddie et

al. 2016, pp. 207–209). For the purposes of assessing recovery of the species across its range, the Service acknowledges that individual populations will vary in viability, and these differences between populations have been accounted for in our current condition analysis within the SBR (Service 2019, entire) and in our evaluation of the species’ overall resiliency, redundancy, and representation.

Recovery Criteria

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the Lists of Endangered and Threatened Wildlife and Plants.

Recovery plans provide a roadmap for us and our partners on methods of enhancing conservation and minimizing threats to listed species, as well as measurable criteria against which to evaluate progress towards recovery and assess the species’ likely future condition. However, they are not regulatory documents and do not substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of a species, or to delist a species, is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

There are many paths to accomplishing recovery of a species, and recovery may be achieved without all of the criteria in a recovery plan being fully met. For example, one or more criteria may be exceeded while other criteria may not yet be

accomplished. In that instance, we may determine that the threats are minimized sufficiently and that the species is robust enough that it no longer meets the Act's definition of an endangered species or a threatened species. In other cases, we may discover new recovery opportunities after having finalized the recovery plan. Parties seeking to conserve the species may use these opportunities instead of methods identified in the recovery plan. Likewise, we may learn new information about the species after we finalize the recovery plan. The new information may change the extent to which existing criteria are appropriate for identifying recovery of the species. The recovery of a species is a dynamic process requiring adaptive management that may, or may not, follow all of the guidance provided in a recovery plan.

Here, we provide a summary of progress made toward achieving the recovery criteria for the golden paintbrush. More detailed information related to conservation efforts can be found below under **Summary of Biological Status and Threats**. We completed a final recovery plan for the golden paintbrush in 2000 (Service 2000, entire), and later supplemented the plan for part of the species' range in 2010 (Service 2010, entire). The 2000 plan includes objective, measurable criteria for delisting; however, the plan has not been updated for more than 20 years, so some aspects of the plan may no longer reflect the best scientific information available for the golden paintbrush.

Since about 2012, a significant increase in the number of new populations has occurred, because of direct seeding within the species' historical range in Washington and Oregon, with perhaps the most significant being the reestablishment of the golden paintbrush at a number of sites in Oregon's Willamette Valley, where the species was once extirpated. In addition to improved propagation techniques, substantial research has been conducted on the population biology, fire ecology, and restoration of the

golden paintbrush (Dunwiddie et al. 2001, entire; Gamon 2001, entire; Kaye and Lawrence 2003, entire; Swenerton 2003, entire; Wayne 2004, entire; WDNR 2004b, entire; Lawrence 2005, entire; Dunwiddie and Martin 2016, entire; Lawrence 2015, entire; Schmidt 2016, entire).

The results of these studies have been used to guide management of the species at sites being managed for native prairie and grassland ecosystems. Active management to promote the golden paintbrush is being done to varying degrees (from targeted to infrequent) across prairie and grassland sites. An active seed production program has been maintained to provide golden paintbrush seeds and other native prairie plant seeds to land managers for population augmentation and restoration projects across the species' range in Washington and Oregon. Additionally, as recommended by the recovery plan for the golden paintbrush (Service 2000, p. 31), the State of Washington prepared a reintroduction plan for the Service as both internal and external guidance (WDNR 2004a, entire).

Below are the delisting criteria described in the 2000 golden paintbrush recovery plan (Service 2000, p. 24), as supplemented in 2010, and the progress made to date in achieving each criterion.

Criterion 1 for Delisting

Criterion 1 is that there are at least 20 stable populations distributed throughout the historical range of the species. To be deemed stable, a population must maintain a 5-year running average population size of at least 1,000 individuals, where the actual count never falls below 1,000 individuals in any year. The golden paintbrush technical team recommended in the 2007 5-year status review that this criterion should be modified. Because it is impractical to count individual vegetative plants, the team recommended that the criterion should be modified to specifically account for a recovered population as equal to 1,000 flowering individuals and known

to be stable or increasing as evidenced by population trends (Service 2007, p. 3).

While we did not officially amend or make an addendum to the recovery plan to incorporate this recommendation, we accepted this as the best way to count population abundance, since monitoring has consistently counted flowering plants, following a standardized methodology set by the Washington Department of Natural Resources Natural Heritage Program (WNHP) (Arnett and Birkhauser 2008, entire; Arnett 2011, entire).

The Service supplemented this criterion in its 2010 recovery plan for the prairie species of western Oregon and southwestern Washington by identifying locations for golden paintbrush reintroductions, specifically to establish five additional populations distributed across at least three of the following recovery zones: Southwest Washington, Portland, Salem East, Salem West, Corvallis East, Corvallis West, Eugene East, and Eugene West. Priority was given to reestablishing populations in zones with historical records of golden paintbrush (Southwest Washington, Portland, Salem East, Corvallis East) (Service 2010, p. IV-37).

Progress on Criterion 1

At the time of the proposed rule (data through 2018), 23 populations averaged at least 1,000 individuals per year over the 5-year period, with 8 populations with a 5-year running average of at least 1,000 individuals. As of 2020, 17 populations averaged at least 1,000 individual plants per year over the 5-year period with most recent data from 2016 to 2020 (2015 to 2019 for sites with no data in 2020). Of these 17 populations, 7 had a 5-year running average of at least 1,000 individuals, and an additional 6 populations had a 3-year running average of at least 1,000 individuals (Gray 2022, in litt.). As noted above, we only count flowering plants during monitoring, so in most years a proportion of individual plants may not be represented in annual counts because they are not flowering during surveys. While the most

recent data do not meet the recovery criteria (of 20 such populations), we find that many of the species' populations are sufficiently resilient to make up for the smaller number of populations based on the following analysis.

Eight populations currently number in the tens of thousands of individuals, the largest totaling 82,692 flowering plants (Glacial Heritage) (Fertig 2021, pp. 16–20). Prior to listing, the largest known population totaled just over 15,000 individuals (Rocky Prairie Natural Area Preserve) (62 FR 31740; June 11, 1997). Abundance at these eight populations is greater (approximately 10,000 or more flowering plants) than the 1,000-individual threshold established at the time of the drafting of the recovery plan for this species (Service 2019, pp. 12–13). These large populations are distributed across the species' range in both Oregon and Washington, contributing to the species' ability to withstand stochastic or catastrophic events. Although it is likely that a number of the more recently established populations are still experiencing variability and may experience an initial peak in abundance followed by a decline to a lower abundance level, these larger populations are more likely to be self-sustaining in the wild over time, are more able to withstand stochastic disturbance, have higher viability, and face an overall lower risk of extirpation than populations at or just above the threshold of 1,000 individuals.

In addition, there are now a minimum of 26 golden paintbrush populations in western Oregon's Willamette Valley, and these populations are distributed across 4 (Corvallis West, Salem West, Portland, Eugene West) of the recovery zones (Kaye 2019, pp. 11–23) identified in the 2010 supplement to the species' recovery plan (Service 2010, pp. IV-4, IV-37). In summary, we conclude that significant progress has been made toward achieving this criterion, and for some populations, the progress is well beyond numerical levels that were anticipated at the time of recovery criteria development. Although we acknowledge annual variability of abundance across sites,

at least eight sites across Washington and Oregon number in the tens of thousands of individuals (Fertig 2021, pp. 16–20), which significantly surpasses the minimum 1,000-individual threshold. This number of individuals increases our confidence that the overall viability of the species is secured, despite having fewer than 20 populations with a 5-year running average of at least 1,000 individuals. In addition, new populations can now be more quickly established through direct seeding and there are multiple sites where the species has recently been seeded. There are also plans to add new outplantings into the future (Fertig 2021, p. 11).

Criterion 2 for Delisting

Criterion 2 is that at least 15 populations over 1,000 individuals are located on protected sites. In order for a site to be deemed protected, it must be either owned or managed by a government agency or private conservation organization that identifies maintenance of the species as the primary management objective for the site, or the site must be protected by a permanent conservation easement or covenant that commits present and future landowners to the conservation of the species.

Progress on Criterion 2

This recovery criterion has not been met as phrased in the recovery plan, because the primary management objective of the protected sites is not always to protect only golden paintbrush. However, we find that the goal of the criterion, a significant number of populations under conservation ownership protective of the species that are likely to be self-sustaining over time, has been greatly exceeded. Forty-five of the 48 golden paintbrush sites are in either public ownership; are owned by a conservation-oriented, nongovernmental organization; or are under conservation easement (Service 2019, p. 62). Such ownership is expected to protect sites from development and land use that would have long-term, wide-ranging deleterious effects on this species. Additionally, 37 sites currently have management practices

that at least preserve essential characteristics of golden paintbrush habitat, and 24 sites have management plans and resources for their implementation for multiple years (Service 2019, pp. 40, 42–44). In addition, at least two of the five conservation easement sites are also enrolled in the Service’s Partners for Fish and Wildlife Program, which provides technical and financial assistance to private landowners to restore, enhance, and manage private land to improve native habitat. At least 3 sites in Washington and 14 sites in Oregon also support other prairie-dependent species currently listed as endangered or threatened species under the Act, and another 5 are part of designated critical habitat for one of these species. Therefore, we anticipate prairie management or maintenance will be ongoing at these golden paintbrush sites for the foreseeable future. Two of the three extant sites in British Columbia that are managed by Parks Canada are also located within designated “ecological reserves” (Service 2019, p. 14). The level of management specific to golden paintbrush varies at each site, but all sites are generally being managed to conserve or restore native prairie or grassland habitats. For additional detail on species management status at sites, see the discussion under **Summary of Biological Status and Threats**, below.

Criterion 3 for Delisting

Criterion 3 is that genetic material, in the form of seeds adequately representing the geographic distribution or genetic diversity within the species, is stored in a facility approved by the Center for Plant Conservation.

Progress on Criterion 3

This recovery criterion is met. Seeds are being stored at two approved facilities, the Rae Selling Berry Seed Bank at Portland State University and the Miller Seed Vault at the University of Washington Botanic Garden. In addition, the active seed production programs at the Center for Natural Lands Management in the South Puget Sound, Washington, and two smaller nurseries in the North Puget Sound,

Washington, continue to provide golden paintbrush seeds to land managers for population augmentation and prairie restoration projects. Production programs were started using seeds from nearly all the populations extant at the time of listing to maintain existing genetic diversity across the species' historical range and to allow for the greatest opportunity for local adaptation at reintroduction sites.

Criterion 4 for Delisting

Criterion 4 is that post-delisting monitoring of the condition of the species and the status of all individual populations is ready to begin.

Progress on Criterion 4

We have developed a post-delisting monitoring plan in cooperation with our lead State partners in Washington (Washington Department of Natural Resources (WDNR)) and in Oregon (Oregon Department of Agriculture (ODA)). The final post-delisting monitoring plan is available for public review on

<https://www.regulations.gov> under Docket No. FWS-R1-ES-2020-0060. We anticipate that the WDNR's WNHP and ODA will coordinate future monitoring. In the post-delisting monitoring plan, we include the monitoring of, at a minimum, all populations established and counted in 2018 that were identified in the SBR (Service 2019, pp. 12–13). These populations will be monitored every other year after final delisting for a 5-year period (i.e., three times, in years 1, 3, and 5, after this final rule is effective). Several key prairie conservation partners may choose to monitor these golden paintbrush sites more frequently and may also choose to monitor additional golden paintbrush sites as more become established across the species' range in Oregon and Washington. Parks Canada oversees periodic monitoring of the three extant populations within British Columbia, Canada. Therefore, this recovery criterion is met.

Criterion 5 for Delisting

Criterion 5 is that post-delisting procedures for the ecological management of habitats for all populations of golden paintbrush have been initiated.

Progress on Criterion 5

This criterion has not been met as phrased in the recovery plan, as procedures for ecological management for all populations are not in place. However, we find that the intent of this criterion has been met because a substantial proportion of known golden paintbrush sites, i.e., 37 out of 48,—more than the 20 populations originally envisioned for these recovery criteria—meet this criterion. At least 24 of the 48 golden paintbrush sites have had prairie or grassland management plans in place for multiple years. An additional 13 sites that lack a long-term management plan for the golden paintbrush receive basic maintenance to preserve the prairie characteristics of golden paintbrush habitat (Service 2019, pp. 42–44). As described earlier, significant strides have been made in the ecological management techniques for restoration and maintenance of prairie landscapes and the reintroduction and management of golden paintbrush at these and other sites. The current level of management varies across extant sites, influenced by need, conservation partner capacity, and funding availability. We anticipate ongoing management at a minimum of 37 of these sites, although the level of management will continue to vary across sites based on these same factors (Service 2019, pp. 40, 42–44) (see additional discussion regarding ongoing site management under **Summary of Biological Status and Threats**, below). The most actively managed sites may include plantings, fencing, prescribed fire, herbicide use for weed control, mowing, and controlled public use. As described above under *Criterion 2 for Delisting*, at least 17 sites currently contain multiple, prairie-dependent species and an additional 5 sites are designated critical habitat for another prairie-dependent species. Those golden paintbrush sites that support multiple, prairie-dependent species listed under the Act are anticipated to receive the

most consistent ecological management into the future. While this recovery criterion has not been fully achieved (i.e., not all populations have post-delisting management procedures in place), ecological management of habitat is expected to occur on the vast majority of the known sites and management will occur on far more than the originally projected 15 sites identified above under *Criterion 2 for Delisting*.

With the more recently identified threat of hybridization from harsh paintbrush (*Castilleja hispida*), additional measures are being implemented and refined to address the impacts to golden paintbrush on contaminated sites and prevent the spread of harsh paintbrush to uncontaminated golden paintbrush sites in the South Puget Sound geographic area in Washington. The Service has developed a strategy and guidance document for securing golden paintbrush sites and outlining solutions necessary for the long-term protection of golden paintbrush from hybridization (Service et al. 2021, entire). In addition, the Service has signed a memorandum of understanding (MOU) with our State conservation partners to ensure hybridization is contained and the conservation strategy is followed to benefit golden paintbrush while supporting recovery of other sympatric (occurring within the same geographical area) prairie species listed under the Act (Service et al. 2020, entire). We provide more information and discussion on the hybridization conservation strategy and how it fits into the conservation of golden paintbrush in **Summary of Biological Status and Threats**, and our response to (15) *Comment*, below.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an “endangered species” or a “threatened species.” The Act defines an “endangered species” as a species that is in danger of extinction throughout all or a significant

portion of its range, and a “threatened species” as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an “endangered species” or a “threatened species” because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or
- (E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a

“threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the species’ expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term foreseeable future extends only so far into the future as we can reasonably determine that both the future threats and the species’ responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’

biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

For species that are already listed as endangered or threatened species, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the downlisting or delisting and the removal of the Act's protections. A recovered species is one that no longer meets the Act's definition of an endangered species or a threatened species. For the golden paintbrush, we consider 30 years to be a reasonable period of time within which reliable predictions can be made for stressors and species' response. This time period includes multiple generations of the golden paintbrush, generally includes the term of and likely period of response to many of the management plans for the species and/or its habitat, and encompasses planning horizons for prairie habitat conservation efforts (e.g., Dunwiddie and Bakker 2011, pp. 86–88; Service 2011, entire; Altman et al. 2017, pp. 6, 20); additionally, various global climate models and emission scenarios provide consistent predictions within that timeframe (Intergovernmental Panel on Climate Change (IPCC) 2014, p. 11). We consider 30 years a relatively conservative timeframe in view of the long-term protection afforded to 93 percent of the species' occupied populations (45 of 48), which occur on conserved/protected lands (Service 2019, p. 62).

Analytical Framework

The SBR documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species. The report does not represent our decision on whether the species should be delisted under the Act. It does, however, provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results

and conclusions from the report, which can be found at Docket FWS-R1-ES-2020-0060 on <https://www.regulations.gov>.

To assess golden paintbrush viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability. We use this information to inform our regulatory decision.

Summary of Biological Status and Threats

Below, we review the biological condition of the species and its resources, and the threats that influence the species' condition in order to assess the species' overall viability and the risks to that viability. In addition, the SBR (Service 2019, entire) documents our comprehensive biological status review for the species, including an assessment of the potential threats to the species. The following potential threats were identified for this species at the time of listing: (1) Succession of prairie and grassland habitats to shrub and forest lands (due to fire suppression, interspecific competition, and invasive species); (2) development of property for commercial, residential, and agricultural use; (3) low potential for expansion and refugia due to

constriction of habitat (from surrounding development or land use); (4) recreational picking (including associated trampling); and (5) herbivory (predation on plants and seeds) (62 FR 31740; June 11, 1997). For our analysis, we assessed the influence of these potential threats on the current status of the species, as well as the influence of two potential threats not considered at the time of listing: hybridization of golden paintbrush with harsh paintbrush, and the impacts of climate change. We also assessed current voluntary and regulatory conservation mechanisms relative to how they reduce or ameliorate existing threats to golden paintbrush.

Habitat Loss

At the time of listing, the principal cause of ongoing habitat loss was succession of prairie and grassland habitats to shrub and forest due to fire suppression, interspecific competition, and invasive species (62 FR 31740; June 11, 1997). The potential for development at, or surrounding, extant sites for commercial, residential, and agricultural purposes also posed a threat to the golden paintbrush at the time of listing. Both of these threat factors were preventing or limiting extant populations from expanding and recruiting into new or adjacent areas and afforded no refugia for the species in the case of catastrophic events.

Currently, ongoing prairie or grassland management or maintenance occurs at the majority of extant golden paintbrush sites. This management includes removal or suppression of trees and both native and nonnative woody shrubs, as well as control of nonnative, invasive grassland plant species through a number of different approaches (e.g., mowing, prescribed fire, mechanical removal, selective-herbicide application, restoration reseeding, etc.). Most golden paintbrush sites have either had prairie or grassland management plans in place for multiple years or receive basic maintenance to preserve the prairie characteristics of golden paintbrush habitat (Service 2019, pp. 42–44). Three golden paintbrush sites in Washington also

currently support other prairie- or grassland-dependent species listed under the Act—the endangered Taylor’s checkerspot butterfly (*Euphydryas editha taylori*) and three threatened subspecies of Mazama pocket gopher (*Thomomys mazama* spp.) (Olympia pocket gopher (*Thomomys mazama pugetensis*), Tenino pocket gopher (*Thomomys mazama tumuli*), and Yelm pocket gopher (*Thomomys mazama yelmensis*))—while an additional five sites in Washington are included in designated critical habitat for the Taylor’s checkerspot butterfly.

Although these five critical habitat sites are currently unoccupied by the Taylor’s checkerspot butterfly, they were designated because they were found to be essential for the conservation of the butterfly (78 FR 61506; October 3, 2013). Harsh paintbrush (*Castilleja hispida*) is a host plant for Taylor’s checkerspot butterfly in the South Puget Sound geographic area in Washington. As we discuss further below (see *Hybridization*), golden paintbrush generally cannot co-occur with harsh paintbrush due to the threat of hybridization. However, as we continue to work with our conservation partners to follow the hybridization strategy and guidance document to prioritize sites for both golden paintbrush and Taylor’s checkerspot butterfly we also continue to explore opportunities to conserve both species on individual sites where appropriate. In addition, at least 14 golden paintbrush sites in Oregon’s Willamette Valley currently support one or more other prairie- or grassland-dependent species listed under the Act that do not present the threat of hybridization—the endangered Fender’s blue butterfly (*Icaricia icarioides fenderi*), endangered Willamette daisy (*Erigeron decumbens*), threatened Kincaid’s lupine (*Lupinus oreganus* var. *kincaidii*, listed as *Lupinus sulphureus* ssp. *kincaidii*), and threatened Nelson’s checker-mallow (*Sidalcea nelsoniana*) (Institute for Applied Ecology 2019, in litt.).

We expect a number of golden paintbrush sites in both Washington and Oregon to continue to be managed in a way that supports the recovery of other

prairie- or grassland-dependent species in addition to the long-term conservation of the golden paintbrush. As long as periodic management or maintenance continues to occur at golden paintbrush sites across the species' range, the threat of prairie or grassland succession is expected to remain adequately addressed into the foreseeable future. State and Federal management plans include specific objectives to continue to protect and conserve the golden paintbrush at a number of sites. States, Federal agencies, and conservation organizations have invested significant resources into golden paintbrush recovery, as well as general prairie and grassland restoration and conservation for a variety of at-risk, prairie-dependent species. We do not anticipate habitat for these prairie-dependent species to contract further given the limited amount of remaining prairie habitat and the long-term investments conservation partners have made, and continue to make, to restore, rebuild, maintain, and conserve these relatively rare regional ecosystems (Dunwiddie and Bakker 2011, entire; Center for Natural Lands Management 2012, in litt., entire; The News Tribune 2014, in litt.; Altman et al. 2017, entire; The Nature Conservancy 2019, in litt., entire).

Golden paintbrush now occurs within 48 separate populations as a result of the numerous reintroduction efforts implemented to recover this species. Only three of these populations are on lands possibly subject to future development. The remaining 45 populations are all under some type of public or conservation ownership (Service 2019, pp. 11–14). Of the 48 extant populations, at least 81 percent (n=39) are on land with some known level of protected status (at a minimum, formally protected as a natural area or other such designation, although not all of these designations are permanent) (Service 2019, pp. 42–44). In addition, of the 39 populations with some protected land status, 19 also include stipulations for, or statements of specific protection of, perpetual management of the golden paintbrush.

Although the total area occupied by the golden paintbrush at 19 of the 48 sites is relatively small (less than 0.4 hectare (ha) (1 acre (ac))), 14 of the 48 sites have between 0.4 to 1.6 occupied ha (1 to 3.9 ac), and another 14 of the 48 sites have from between 2 to 18.6 occupied ha (5 to 46 ac). We lack this information at one site (Service 2019, pp. 37–38). All but 4 of the 48 sites have available land for future golden paintbrush population expansion or shifts in distribution. Of the 33 sites with less than 2 ha (5 ac) of occupied habitat, 10 have an estimated range of 0.8 to 2 ha (2 to 5 ac) of additional habitat for expansion, and at least 13 have an estimated range of 2 to 6 ha (5 to 15 ac) of additional habitat for future expansion (Service 2019, pp. 37–38). In addition, the species is much less reliant on expanding site-use and refugia than at the time of listing, when only 10 extant populations of the golden paintbrush remained. The reintroduction and seed production techniques developed for golden paintbrush recovery have provided the means to more easily establish or reestablish populations at prairie restoration sites than were previously possible. Many of these sites have been specifically acquired for their potential overall size, conservation value, and conservation status. The golden paintbrush has been reintroduced and established at prairie restoration sites that are well-distributed across the species' historical range, well beyond the 10 extant sites at the time of listing. As a result of these conditions, we do not anticipate development in or around these sites to become a threat to the golden paintbrush in the foreseeable future.

Recreational Picking and Trampling

At the time of listing, we considered overutilization from recreational picking (flowers) to be a threat (62 FR 31740; June 11, 1997). Our concern with recreational picking or collection of flowers was that it would reduce overall potential seed-set at a population. Concern has also been noted regarding the direct harvesting of seed capsules (Dunwiddie 2018, in litt.). Although there is evidence of occasional

recreational or possible commercial collection of capsules that reduced the amount of seed available on a site, collection is no longer considered a significant stressor to the species across its range (Service 2019, p. 47). In addition, the current number of established and protected golden paintbrush populations, many with limited or restricted access, largely ameliorates this previously identified threat. We acknowledge that the golden paintbrush is likely a desirable species for some gardeners or plant collectors. However, when delisted (see **DATES**, above), golden paintbrush seeds or plants are likely to become available through controlled sale to the public from regional prairie conservation partners and/or regional native plant nurseries, similar to what occurs with other non-listed prairie plant species. For these reasons, we do not expect the possible collection of golden paintbrush flowers or seeds to become a threat to the species in the foreseeable future.

At the time of listing, we identified trampling of golden paintbrush plants by recreationalists as impacting the species at some sites with high levels of public use, especially where and when associated with recreational picking of golden paintbrush flowers. Although some risk of trampling to plants will always be present across public sites (e.g., State parks, national wildlife refuges), most sites often have some level of restricted access when golden paintbrush plants are in bloom (e.g., fenced from deer or inaccessible to the public) or there are defined walking or viewing areas. Therefore, when compared with the potential impact of trampling at the time of listing, the current impact is likely insignificant, due to the number of reestablished golden paintbrush populations, the large size of many of these sites, and considerable abundance of golden paintbrush plants at some of these sites. For the above reasons, we also do not anticipate that trampling will become a threat in the foreseeable future.

Herbivory

At the time of listing, we considered predation (herbivory) on the golden paintbrush by native (voles and deer) and introduced (rabbits) species to be a threat to the plant (62 FR 31740; June 11, 1997); however, the best available information does not indicate it is a current or future threat. Although deer and elk exhibit herbivory on the golden paintbrush at some sites, there is annual and site-specific variability in the overall level of herbivory (Service 2019, p. 48; Martin 2021, p. 9). Herbivory impacts from rabbits and voles on the golden paintbrush have not been broadly or consistently observed and also appear to be variable across sites and years. Where herbivory by deer or rabbits or both has been significant, control with fencing has been successfully implemented, but controlling herbivory through fencing over large areas is limited by cost (Service 2019, p. 48). In addition, encouraging localized reduction of deer populations through lethal removal near some sites (Washington Department of Fish and Wildlife 2019, in litt.; Pelant 2019, in litt.) and installing raptor perch poles to control rodents and rabbits at some sites are also being implemented to reduce impacts of herbivory on the golden paintbrush (Service 2019, p. 48). As a consequence of the significant increase in the number of golden paintbrush populations that have been successfully established across the species' range since it was listed, and because the impact of herbivory is being adequately managed in at least a portion of those sites where noted as significant (potential site- or population-level effect), we conclude predation (herbivory) no longer has a significant impact across the majority of the golden paintbrush's 48 sites/populations, nor at the species level, and it is unlikely to become a threat to the species in the foreseeable future.

Hybridization

As noted above, a potential threat to the golden paintbrush identified after the species was listed in 1997 was the impact of hybridization with the harsh paintbrush. The harsh paintbrush is one of the host plants introduced to prairie sites targeted for

endangered Taylor's checkerspot butterfly recovery efforts. Our 2007 5-year status review recommended, "the evaluation of the potential for genetic contamination of golden paintbrush populations by hybridization with other species of *Castilleja*" (Service 2007, p. 15). After initial evaluation, the potential risk of hybridization was considered relatively low and manageable (Kaye and Blakeley-Smith 2008, p. 13). However, after further evaluation and additional observations in the field, hybridization with the harsh paintbrush has now been identified as a significant potential threat to golden paintbrush populations where the two species occur together or in close proximity (Clark 2015, entire; Sandlin 2018, entire). Three former golden paintbrush recovery sites have now been discounted by the Service for the purposes of recovery due to the level of hybridization at these sites (Service 2019, p. 15). At least one other site is currently vulnerable to the effects of hybridization, but management efforts to date (removal of plants that exhibit hybrid characteristics and creation of a zone of separation between harsh paintbrush and golden paintbrush areas at the site) have maintained this golden paintbrush population. Currently, hybridization appears to be confined to those areas located in the South Puget Sound prairie region where both species of *Castilleja* were used at some of the same habitat restoration sites. The only known incident of hybridization outside of this region was at Steigerwald Lake National Wildlife Refuge in southwestern Washington, where we unknowingly used a seed mix that included the harsh paintbrush. This site has since been eradicated of both *Castilleja* species, but we anticipate reintroducing the golden paintbrush to the site in the future (Ridgefield National Wildlife Refuge Complex 2019, in litt., entire).

As a response to this emerging threat, efforts were implemented, and are ongoing, to reduce or eliminate the risk of hybridization to the golden paintbrush. These include efforts such as maintaining isolated growing areas for the golden

paintbrush and harsh paintbrush at native seed production facilities used in prairie restoration efforts, maintaining buffers between golden paintbrush and harsh paintbrush patches at sites where both species are currently present, and delineating which of the two species will be used at current and future prairie conservation or restoration sites. We recently developed a strategy and guidance document for securing golden paintbrush sites to address containment of hybridization at existing contaminated sites and prevention of unintentional spread of hybridization to other regions within the golden paintbrush's range, specifically north Puget Sound and the Willamette Valley (Service et al. 2021, entire). We have also entered into an associated MOU with the Washington Department of Fish and Wildlife (WDFW) and WDNR to ensure the strategy is implemented as agreed to by all prairie conservation partners in the range of the golden paintbrush (Service et al. 2020, entire). The three agencies have authority over these species and will oversee most prairie restoration efforts in Washington, particularly in South Puget Sound. This MOU is expected to facilitate awareness and compliance with the hybridization strategy and guidance by our prairie conservation partners across the range of the golden paintbrush. The formal adoption and implementation of the hybridization strategy and guidance is expected to prevent hybridization from becoming a threat to the golden paintbrush in the foreseeable future. Please see our response to *(12) Comment*, below, for additional discussion regarding hybridization.

Climate Change

At the time of listing, the potential impacts of climate change on the golden paintbrush were not discussed. The term “climate” refers to the mean and variability of relevant quantities (i.e., temperature, precipitation, wind) over time (IPCC 2014, pp. 119–120). The term “climate change” thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that

persists for an extended period, typically decades or longer, whether the change is due to internal processes or anthropogenic changes (IPCC 2014, p. 120).

Scientific measurements spanning several decades demonstrate that changes in climate are occurring. In particular, warming of the climate system is unequivocal, and many of the observed changes in the last 60 years are unprecedented over decades to millennia (IPCC 2014, p. 2). The current rate of climate change may be as fast as any extended warming period over the past 65 million years and is projected to accelerate over the next 30 to 80 years (National Research Council 2013, p. 5). Thus, rapid climate change is adding to other sources of extinction pressures, such as land use and invasive species, which will likely place extinction rates in this era among just a handful of the severe biodiversity crises observed in Earth's geological record (American Association for the Advancement of Science (AAAS) 2014, p. 7).

Global climate projections are informative, and in some cases, the only or the best scientific information available for us to use. However, projected changes in climate at the global scale and related impacts can vary substantially across and within different regions of the world (e.g., IPCC 2013 and 2014, entire) and within the United States (Melillo et al. 2014, entire). Therefore, we use “downscaled” projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species (see Glick et al. 2011, pp. 58–61, for a discussion of downscaling).

Climate change trends predicted for the Pacific Northwest (Oregon, Washington, Idaho, and Montana) broadly consist of an increase in annual average temperature; an increase in extreme precipitation events; and, with less certainty, variability in annual precipitation (Bachelet et al. 2011, p. 413; Dalton et al. 2013, pp. 31–38, figure 1.1; Snover et al. 2013, pp. 5-1–5-4).

Based on a 2014 climate change vulnerability assessment, the golden paintbrush was considered “presumed stable” (Gamon 2014, entire). After the completion of the SBR (Service 2019, entire), a new assessment was conducted on sites in Washington, which evaluated only the populations extant at the time of listing (11 extant and 11 populations that were extirpated; none of the 10 outplanted sites in Washington); this new assessment considered golden paintbrush as “highly vulnerable” to climate change (Young et al. 2016, entire; Kleinknecht et al. 2019, entire). Please see our response to *(10) Comment*, below, for more discussion regarding this new information.

Prolonged or more intense summer droughts are likely to increase in the Pacific Northwest due to climate change (Snover et al. 2013, p. 2-1). Regional climate change literature suggests that prairie ecosystems were established under warmer and drier conditions and are unlikely to be disadvantaged from future increased summer drought (Bachelet et al. 2011, p. 417). However, although the golden paintbrush senescens as the prairies dry out in the summer, increased intensity or length of drought conditions will likely stress plants and increase mortality, resulting in reduced numbers of individuals in populations at less-than-optimal sites (Kaye 2018, in litt.).

As is the case with all stressors we assess, even if we conclude that a species is currently affected or is likely to be affected in a negative way by one or more climate-related impacts, it does not necessarily follow that the species meets the definition of an “endangered species” or a “threatened species” under the Act.

Predicted environmental changes resulting from climate change may have both positive and negative effects on the golden paintbrush, depending on the extent and type of impact and depending on site-specific conditions within each habitat type. The primary predicted negative effect includes drought conditions resulting in

inconsistent growing seasons. Likewise, future temperature changes may influence the timing of native prairie plant phenology, which could lead to asynchronies with pollinators (Reed et al. 2019, entire). This effect will likely be buffered by the ability of the golden paintbrush to survive in a range of soil conditions, as is evident by its establishment on a wide variety of sites across its 300-mile geographic range, with a number of different host plants, and under a range of precipitation levels. We have not identified any predicted environmental effects from climate change that may be positive for the golden paintbrush at this time. Climate change could result in a decline or change in bumble bee diversity within the range of the golden paintbrush (Soroye et al. 2020, entire); the bumble bee is an important pollinator for the golden paintbrush (Service 2019, pp. 6–7). However, there are limited data at this time to indicate the potential loss of bumble bee diversity is a specific and present threat to the golden paintbrush. Also, observations of reduced seed production at some Washington sites in recent years (2019–2021) could be the result of recent drought events, although it remains unclear how these observations translate to population abundance and trends over time. Golden paintbrush populations can experience high variability in abundance between years (Fertig 2021, pp. 24–27), and while climate change is a stressor, given the species’ high abundance and distribution across the 300-mile range from British Columbia to Oregon, we expect the golden paintbrush has sufficient resiliency and redundancy to remain viable into the foreseeable future. Establishing plant populations such as the golden paintbrush across the full geographic and climatic range of Pacific Northwest prairies has been identified as a “climate-smart” strategy given the extensive north-south range encompassing variable temperature and precipitation patterns (Bachelet et al. 2011, p. 420). The species appears to have sufficient resiliency and redundancy across its range to maintain sufficient viability during drought years. As evidence, the last 4 years of monitoring

(2017–2020) represent the 4 years with greatest abundance rangewide despite extreme drought experienced between 2015 and 2016 in Oregon and Washington (Fertig 2021, p. 30; National Oceanic and Atmospheric Administration National Integrated Drought Information System (NOAA NIDIS) 2022, entire). In addition, the year 2020 also represents the second-highest abundance of golden paintbrush in the State of Washington at 202,208 flowering plants, which was a 47.8 percent increase from 136,846 in 2019. Additionally, several outplantings have been initiated at new locations since 2018 in Washington, and we are continuing to work with our partners to plan new outplantings across the species' range that will further add to the species' resiliency and redundancy.

In summary, climate change is affecting, and will continue to affect, temperature and precipitation events within the range of the golden paintbrush. The extent, duration, and impact of those changes are unknown, but could potentially increase or decrease precipitation in some areas and increase temperatures found within the range of the golden paintbrush. Golden paintbrush may experience climate change-related effects in the future, most likely at the individual or local population scale; however, we anticipate the species will remain viable, because: (1) It is more resilient than at the time of listing as a result of increased abundance, number of sites, and geographic distribution in a variety of ecological settings, contributing to the species' resiliency, redundancy, and representation; (2) available information indicates the golden paintbrush is somewhat adaptable to some level of future variation in climate conditions (Service 2019, pp. 22–25, 45); (3) there are ongoing efforts to expand the golden paintbrush to additional suitable sites across the species' range; and (4) we now have the technical ability to effectively and more readily establish populations, which could help to mitigate future population losses. Therefore, based upon the best available scientific and commercial information, we

conclude that climate change does not currently pose a threat to the golden paintbrush, nor is it likely to become a threat to the golden paintbrush in the foreseeable future (next 30 years).

Voluntary and Regulatory Conservation Mechanisms

For current federally listed species, we consider existing regulatory mechanisms relative to how they reduce or ameliorate threats to the species absent the protections of the Act. Therefore, we examine whether other regulatory mechanisms would remain in place if the species were delisted, and the extent to which those mechanisms will continue to help ensure that future threats will be reduced or eliminated. In the final listing rule (62 FR 31740; June 11, 1997), we noted that habitat management for the golden paintbrush was not assured, despite the fact that most populations occurred in areas designated as reserves or parks that typically afforded the golden paintbrush and its habitat some level of protection through those designations. As discussed in our SBR (Service 2019, pp. 47-52), the threat of habitat loss from potential residential or commercial development has decreased since the time of listing due to the establishment of new golden paintbrush populations on protected sites. Although a few privately owned sites are still at some potential risk, development is no longer considered a significant threat to the viability of the golden paintbrush due to the number of sites largely provided protection from development (Service 2019, pp. 12–14).

Federal

Sikes Act—The Sikes Act (16 U.S.C. 670 et seq.) provides the authority and defines the responsibilities to facilitate effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation on military installations. The Sikes Act requires that conservation goals are cooperatively developed and recorded in a planning document called an integrated

natural resources management plan (INRMP). One golden paintbrush population currently occurs on a Federal military installation (Forbes Point, Naval Air Station Whidbey Island in Island County, Washington) and is managed under an INRMP (U.S. Department of Defense (USDOD) 2013, pp. 3–7) authorized by the Sikes Act. Special management and protection requirements for golden paintbrush habitat in the INRMP include maintenance of a 10-ac management area for the species, including: maintaining and improving a fence around the population to exclude both people and herbivores; posting signs that state the area is accessible to “authorized personnel only”; mowing and hand-cutting competing shrubs in the area; outplanting nursery-grown plants from seeds previously collected onsite; and implementing additional habitat management actions, such as controlled burns or herbicide control of competing vegetation, that are identified in the future to enhance the golden paintbrush population (USDOD 2013, pp. 3–7). These protections are effective in protecting the golden paintbrush on this site and are expected to continue in the absence of protections under the Act because the Sikes Act mandates the Department of Defense to conserve and rehabilitate wildlife, fish, and game on military installations.

National Wildlife Refuge System Improvement Act—Ten golden paintbrush populations currently occur on National Wildlife Refuge (NWR) lands (Dungeness NWR in Washington; and Ankeny, William L. Finley, Tualatin River, and Baskett Slough NWRs in Oregon). As directed by the National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105–57), refuge managers have the authority and responsibility to protect native ecosystems, fulfill the purposes for which an individual refuge was founded, and implement strategies to achieve the goals and objectives stated in management plans. For example, William L. Finley NWR (Benton County, Oregon) includes extensive habitat for the golden paintbrush,

including four known populations, while a number of additional NWRs in Oregon (Ankeny NWR, Marion County; Tualatin River NWR, Washington County; and Baskett Slough NWR, Polk County) and Washington (Dungeness NWR, Clallam County) each also support at least one golden paintbrush population.

The Willamette Valley comprehensive conservation plan (CCP) for William L. Finley, Ankeny, and Baskett Slough NWRs is a land management plan finalized in 2011 with a 15-year term that directs maintenance, protection, and restoration of the species and its habitat and identifies specific objectives related to establishment of populations and monitoring, as well as related habitat maintenance/management (Service 2011, pp. 2-45–2-46, 2-66–2-70). Given the 15-year timeframe of CCPs, these protections would remain in place until at least 2026, regardless of the golden paintbrush's Federal listing status.

Tualatin River NWR finalized a CCP in 2013 (Service 2013a, entire), and although it does not have conservation actions specific to the golden paintbrush identified in the plan, it does have maintenance and management activities for oak savanna habitat on the NWR, which supports the golden paintbrush (Service 2013a, pp. 4-9–4-10). These activities include various methods (e.g., mechanical and chemical) for reducing encroachment of woody species, controlling nonnative and invasive plant species, and reestablishing native grasses and forbs. Given the 15-year timeframe of CCPs, protections outlined in the Tualatin River NWR CCP are expected to remain in place until at least 2028, regardless of the golden paintbrush's Federal listing status.

Dungeness NWR also finalized a CCP in 2013 (Service 2013b, entire). The CCP does not have any conservation actions specific to the golden paintbrush identified; however, it does identify general actions taken to control nonnative and invasive plant species that invade habitats on the refuge, including those inhabited by

the golden paintbrush (Service 2013b, pp. 4-44–4-45). The golden paintbrush population at this NWR’s headquarters continues to be maintained and protected.

In addition to specific protections for the golden paintbrush provided under CCPs, the species is permanently protected by the mission of all NWRs to manage their lands and waters for the conservation of fish, wildlife, and plant resources and their habitats.

National Park Service Organic Act—One golden paintbrush site currently occurs on National Park Service (NPS) lands (American Camp, San Juan Island National Historical Park, Washington). The NPS Organic Act of 1916 (54 U.S.C. 100101 et seq.), as amended, states the NPS will promote and regulate the use of the National Park system to conserve the scenery, natural and historic objects, and wildlife therein, to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (54 U.S.C. 100101(a)). Further, in title 36 of the Code of Federal Regulations (CFR) at § 2.1(a)(1)(ii), NPS regulations specifically prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from their natural state plants, or the parts or products thereof, on lands under NPS jurisdiction. This prohibition extends to the golden paintbrush where it exists on NPS-managed lands. In addition, the General Management Plan for the San Juan Island National Historical Park includes the NPS’s goal of restoring a prairie community that support functions and values of native habitat, including habitat for native wildlife and rare species, such as the golden paintbrush (NPS 2008, p. 249).

Endangered Species Act—The golden paintbrush often co-occurs with other plant and animal species that are listed under the Act, such as the endangered Willamette daisy and endangered Taylor’s checkerspot butterfly. Therefore, some of the general habitat protections (e.g., section 7 consultation and ongoing recovery

implementation efforts, including prairie habitat restoration, maintenance, and protection) for these other prairie-dependent, listed species will indirectly extend to some golden paintbrush sites when we delist the golden paintbrush. We acknowledge that some sites that support Taylor's checkerspot butterfly will not be available for golden paintbrush due to the threat of hybridization between golden and harsh paintbrush; however, given that hybridization has only impacted populations in the South Puget Sound area of Washington, and the extensive range of golden paintbrush in other areas where hybridization is currently not a threat, we assume that management for prairie-dependent species across the range will benefit golden paintbrush beyond delisting. Likewise, the hybridization strategy and guidance document and our partnership with State agencies in Washington will ensure that hybridization is minimized or avoided into the future (Service et al. 2020, entire; Service et al. 2021, entire).

Protections in Canada—The golden paintbrush in Canada is currently federally listed as “endangered” under the Species at Risk Act (SARA) (COSEWIC 2007, entire). SARA regulations protect species from harm, possession, collection, buying, selling, or trading (Statutes of Canada 2002, c. 29). SARA also prohibits damage to or destroying the habitat of a species that is listed as an endangered species. The population at Trial Island is on Canadian federal lands protected under SARA (COSEWIC 2011, in litt., p. 5). The golden paintbrush is not currently protected under any provincial legislation in British Columbia. However, the golden paintbrush occurs in the ecological reserves that include Trial Island and Alpha Islet, which are protected under the British Columbia Park Act (COSEWIC 2011, in litt., p. 5). The British Columbia Park Act allows lands identified under the Ecological Reserve Act to be regulated to restrict or prohibit any use, development, or occupation of the land or any use or development of the natural resources in an

ecological reserve (Revised Statutes of British Columbia 1996, c. 103). This includes particular areas where rare or endangered native plants and animals in their natural habitat may be preserved.

State

Washington Natural Heritage Plan—Washington State’s Natural Heritage Plan identifies priorities for preserving natural diversity in Washington State (WDNR 2018, entire). The plan aids WDNR in conserving key habitats that are currently imperiled, or are expected to be imperiled in the future. The prioritization of conservation efforts provided by this plan is expected to remain in place if we delist the golden paintbrush. The golden paintbrush is currently identified as a priority 2 species (species likely to become endangered across their range or in Washington within the foreseeable future) in the State’s 2018 plan (WDNR 2018a, in litt., p. 4), which is a recent change from the species’ priority 1 designation (species are in danger of extinction across their range, including Washington) in 2011 (WDNR 2018b, in litt., p. 2). The State’s conservation status is not necessarily impacted by Federal delisting and is ultimately at the discretion of WDNR. We anticipate that WDNR will continue to monitor the species where it occurs on their own lands and more broadly as a partner in the post-delisting monitoring plan. We also anticipate that WDNR will continue to actively manage their golden paintbrush sites because these areas are not only important to the long-term conservation of golden paintbrush, but also to other at-risk prairie species.

Washington State Park Regulations and Management—In Washington, State park regulations, in general, require an evaluation of any activity conducted on a park that has the potential to damage park resources, and require mitigation as appropriate (see title 352 of the Washington Administrative Code). Wildlife, plants, all park buildings, signs, tables, and other structures are protected; removal or damage of any

kind is prohibited (Washington State Parks and Recreation Commission 2019, in litt., p. 2). One golden paintbrush site currently exists on Fort Casey Historical State Park. One of the objectives for natural resources on Fort Casey Historical State Park under the Central Whidbey State Parks Management Plan is to protect and participate in the recovery of the golden paintbrush, including protecting native plant communities, managing vegetative succession, and removing weeds through integrated pest management (Washington State Parks and Recreation Commission 2008, p. 15). The plan further states that areas where the golden paintbrush occurs will be classified as “heritage affording a high degree of protection,” and the Nass Natural Area Preserve (also known as Admiralty Inlet Natural Area Preserve) is included in the long-term park boundary to also assure continued preservation of the golden paintbrush in this area (Washington State Parks and Recreation Commission 2008, p. 26).

Oregon Revised Statutes (ORS), Chapter 564—Oregon Revised Statutes, chapter 564, “Wildflowers; Threatened or Endangered Plants,” requires State agencies to protect State-listed plant species found on their lands. Any land action on Oregon land owned or leased by the State, for which the State holds a recorded easement, and which results, or might result, in the taking of an endangered or threatened plant species, requires consultation with Oregon Department of Agriculture staff (see ORS section 564.115). The golden paintbrush is currently State-listed as endangered in Oregon. At this time, no populations of the golden paintbrush are known to occur on State lands in Oregon. However, should populations of the golden paintbrush occur on Oregon State lands in the future, the removal of Federal protections for the golden paintbrush would not affect State protection of the species under this statute.

In summary, conservation measures and existing regulatory mechanisms have minimized, and are continuing to address, the previously identified threats to the

golden paintbrush, including habitat succession of prairie and grassland habitats to shrub and forest lands; development of property for commercial, residential, and agricultural use; recreational picking (including associated trampling); and herbivory (on plants and seeds). As indicated above, we anticipate the majority of these mechanisms will remain in place regardless of the species' Federal listing status.

Cumulative Impacts

When multiple stressors co-occur, one may exacerbate the effects of the other, leading to effects not accounted for when each stressor is analyzed individually. The full impact of these synergistic effects may be observed within a short period of time, or may take many years before it is noticeable. For example, high levels of predation (herbivory) on the golden paintbrush by deer could cause large temporary losses in seed production in a population, but are not generally considered to be a significant threat to long-term viability, as populations that are relatively large and well-distributed should be able to withstand such naturally occurring events. However, the relative impact of predation (herbivory) by deer may be intensified when it occurs in conjunction with other factors that may lessen the resiliency of golden paintbrush populations, such as prolonged woody species encroachment (prairie succession); extensive nonnative, invasive plant infestations; or possible increased plant mortality resulting from the effects of climate change (i.e., prolonged drought).

Although the types, magnitude, or extent of potential cumulative impacts are difficult to predict, we are not aware of any combination of factors that is likely to co-occur resulting in significant negative consequences for the species. We anticipate that any negative consequence of co-occurring threats will be successfully addressed through the same active management actions that have contributed to the ongoing recovery of the golden paintbrush and the conservation of regional prairie ecosystems that are expected to continue into the future.

Summary of Biological Status

To assess golden paintbrush viability, we evaluated the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). We assessed the current resiliency of golden paintbrush sites (Service 2019, pp. 52–63) by scoring each site’s management level, site condition, threats addressed, site abundance of plants, and site protection, resulting in a high, moderate, or low condition ranking. One-third of sites were determined to have a high condition ranking, one-third a moderate condition ranking, and one-third a low condition ranking (Service 2019, p. 63). This represents 32 sites in a moderate or higher condition based on those important factors directly informing resiliency of individual sites or populations within the SBR (Service 2019, p. 63). This number of sites exceeds the 15 to 20 populations in stable condition on protected lands that the recovery criteria identified as needed to achieve recovery; this therefore provides sufficient resiliency for the species.

Golden paintbrush sites are well-distributed across the species’ historical range and provide representation across the four geographic areas within that range (British Columbia, North Puget Sound, South Puget Sound, and the Willamette Valley). Multiple sites or populations exist within each of these geographic areas, providing a relatively secure level of redundancy across the historical range, with the lowest relative level of redundancy within British Columbia. The resiliency of the golden paintbrush is variable across the historical range given differences in site or population abundance, level of management at a site, and site condition. The best scientific and commercial data available indicate that the golden paintbrush is composed of multiple populations, primarily in moderate to high condition (Service 2019, p. 63), which are sufficiently resilient, well-distributed (redundancy and representation), mostly in protected areas, and managed such that they will be

relatively robust or resilient to any potential cumulative effects to which they may be exposed.

Summary of Comments and Recommendations

In our June 30, 2021, proposed rule (86 FR 34695), we requested that all interested parties submit written comments on the proposal by August 30, 2021. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposed rule. Newspaper notices inviting general public comment were published in The Oregonian on July 11, 2021, and the Seattle Times on July 9 through July 13, 2021. We did not receive any requests for a public hearing. All substantive information provided during the comment period either has been incorporated directly into this final rule or is addressed below.

Public Comments

We received 10 public comments in response to the proposed rule. We reviewed all comments we received during the public comment period for substantive issues and new information regarding the proposed rule. Eight commenters provided substantive comments or new information concerning the proposed delisting for golden paintbrush. Below, we provide a summary of the substantive issues raised in the public comments we received; however, comments outside the scope of the proposed rule, and those without supporting information, do not warrant an explicit response and, thus, are not presented here. Identical or similar comments have been consolidated into responses based on comment theme.

(1) Comment: We received multiple comments from WDNR and others stating that golden paintbrush has not met all the recovery criteria specified in the recovery plan.

Response: Recovery plans provide roadmaps to species recovery but are not required in order to achieve recovery of a species, or to evaluate it for delisting. In addition, recovery plans are also nonbinding documents that rely on voluntary participation from landowners, land managers, and other recovery partners. A determination of whether a valid, extant species should be delisted is made solely on the question of whether it meets the Act's definitions of an "endangered species" or a "threatened species." Recovery criteria and objectives are developed based on the information known at that time, and much is learned about a species between the time the recovery plan is developed and the time we reassess whether it meets the Act's definition of endangered or threatened. Based on the best available information, we have determined that golden paintbrush no longer meets either of these definitions.

(2) *Comment:* We received several comments from WDNR and others questioning the metric in recovery criterion 1 to evaluate a stable population, suggesting it was no longer based on the best available science and providing examples of populations that have declined. A comment from WDNR also presented updated information on progress towards meeting this criterion from 2018–2020.

Response: We updated this final rule to reflect the most up-to-date progress toward this criterion (see discussion under *Criterion 1 for Delisting*, above). As discussed earlier in this document, that criterion states that to be deemed stable, a population must maintain a 5-year running average population size of at least 1,000 individuals, where the actual count never falls below 1,000 individuals in any year. The 2007 5-year review recommended counting only flowering individuals and incorporating a stable or increasing population trend as based on a zero or positive overall trend over 5 years (Service 2007, p. 3). While we did not officially amend or make an addendum to the recovery plan, we accepted that the most practical way to determine population abundance was to count flowering plants. The recommendation

to evaluate populations based on stable or increasing trends in abundance was not formally incorporated into an amended recovery plan. However, in addition to evaluating progress toward the recovery criteria, we also evaluated in the SBR (Service 2019, entire) the resiliency, redundancy, and representation across the species' range in relation to the potential threats to the species. In the SBR, we evaluated the current condition of the species at sites using various parameters, including the level of management, site condition, threats addressed, abundance, and site protection status. We elicited the advice of experts to evaluate sites based on these parameters. Populations were also separately evaluated in the SBR with a site viability index that took into account population stability and trend. All of this information was considered when evaluating and making our determination as to whether delisting is warranted.

Some populations that once maintained higher levels of abundance have declined, and that abundance can vary markedly across populations and annually within populations (Fertig 2021, p. 23). Despite this variability in abundance, the species has sufficient resiliency and redundancy across its range to maintain viability. In the current condition analysis of the SBR, 16 sites were ranked as high condition, with 9 of these sites in Oregon and 7 in Washington. This distribution of high condition sites across the range of the species contributes to the redundancy of golden paintbrush. We developed a post-delisting monitoring plan that will help verify that golden paintbrush remains secure into the future without the protections of the Act.

(3) *Comment:* The WDNR stated opposition to the proposed delisting rule. Despite improvements in species condition from the time of listing, the WDNR stated that delisting was premature based on concerns regarding uncertainties related to golden paintbrush's long-term abundance and viability. The WDNR and other

commenters expressed concern about the funding available for continued management and monitoring once delisted.

Response: Our review of the best available scientific and commercial data indicates that the threats to the golden paintbrush have been eliminated or reduced to the point that the species no longer meets the definition of an endangered or threatened species under the Act (see **Determination of Golden Paintbrush's Status**, below). Individual sites may experience variability in abundance, and while some have declined, others have increased in recent years (see *Range, Distribution, Abundance, and Trends of Golden Paintbrush*, above). Despite variability in abundance, the successful establishment of outplanted golden paintbrush populations, primarily in moderate to high condition, and mostly in protected areas with management help to increase the resiliency, redundancy, and representation of the species and contribute to its viability. For more discussion of golden paintbrush's population trends and viability, see *Range, Distribution, Abundance, and Trends of Golden Paintbrush Summary of Biological Status and Threats*, and **Recovery Criteria**, above.

Golden paintbrush is a management-dependent species, and even with sufficient resources, populations can decline due to various factors. Although the majority of populations are under conservation ownership that includes management practices to preserve essential characteristics of golden paintbrush habitat, declines can still occur. Conservation management will continue in these habitats, but not necessarily to the same degree at all locations due to variations in capacity, need, or constraints. As part of the current condition analysis in the SBR, the management level was assessed for each site based on expert elicitation and the best available information (see Service 2019, pp. 40–44). This analysis indicated that the majority of the sites will receive, at minimum, maintenance to preserve essential

characteristics of golden paintbrush habitat, with several sites operating under long-term management plans with committed resources for management (see Service 2019, pp. 40–44). The number of and distribution of populations established across the range contributes to the resiliency and redundancy of the species, and its ability to maintain sufficient viability despite some variability in management. Management will also continue to adapt over time to address future challenges in maintaining and restoring prairie ecosystems. Funding for some management activities will likely decline post-delisting as some funding sources are focused on the recovery of listed species; however, the commitments of our partners to golden paintbrush conservation, as well as the number of sites sharing similar habitat and conservation objectives for other prairie species of concern, will help ensure continued management of the species into the future. Additionally, our post-delisting monitoring plan will assess abundance as well as site management and protection over a minimum 5-year period after delisting.

Regarding continued monitoring by WNHP, golden paintbrush is currently State-listed as priority 2 in the Washington State Natural Heritage Plan, and State listing and prioritization is ultimately at the discretion of the State. Like many State-listed plant species and other plant species of State concern, we anticipate that the WDNR through its WNHP and ODA will continue to monitor golden paintbrush in Washington and Oregon, respectively, although monitoring efforts may not occur as often as they have in the past. .

(4) Comment: Several commenters stated concern over the likelihood for post-delisting management to continue and be effective. Comments included site-specific examples such as Forbes Point, American Camp, Rocky Prairie, and Glacial Heritage where decline in golden paintbrush abundance due to invasion by exotic grasses or other unknown factors occurred despite support or management for the species.

Response: As we describe above in our response to *Comment (3)* management will also continue to adapt over time to address future challenges in maintaining and restoring prairie ecosystems and the PDM plan will assess abundance as well as site management and protection over a minimum 5-year period after delisting. Please see our response to *Comment (3)*, above, for a discussion of variation in abundance and management for the species and our response to *Comment (5)*, below, about declines in abundance in some populations.

Regarding the site-specific examples provided by commenters, the Forbes Points and American Camp sites are in low condition, the Rocky Prairie site is in moderate condition and the Glacial Heritage site is in high condition based on our current condition analysis in the SBR which considered management level among other factors that can impact site condition including habitat condition, threats, abundance, and site protection status (Service 2019, p. 54).

(5) Comment: We received comments from WDNR and others providing updated survey data from 2019 and 2020 for outplanted populations, describing the variable survey effort and an overall decline in abundance from 2018.

Response: WDNR and others provided updated abundance information for outplanted populations since 2018, which we considered and incorporated into this Final Rule (see *Range, Distribution, Abundance, and Trends of Golden Paintbrush*, above). As described in their comments, outplanted populations reached their highest peak to date in 2018 at 562,726 flowering plants and declined to 325,320 plants in 2019. In 2020, there was a reduction of survey effort, and 25 populations in Oregon were not surveyed due to COVID restrictions. If 2019 data were substituted for the 25 populations in Oregon that were not surveyed in 2020, it is assumed, based on extrapolation, that the estimated 2020 rangewide abundance would be greater than 370,000 plants (Fertig 2021, p. 22). Even without the 25 sites that were not monitored

in 2020, the last 4 years of monitoring (2017–2020) represent the 4 years with greatest abundance rangewide. The year 2020 also represents the second-highest abundance of golden paintbrush in Washington State at 202,208, which was a 47.8 percent increase from 136,846 in 2019. Several new outplantings have been initiated since 2018, and we are continuing to work with our partners to plan new outplantings in Oregon and Washington. Individual sites may experience variability, and while some have declined, others have increased in recent years (Service 2019, pp. 27–29; Fertig 2021, pp. 11–29). The species appears to have sufficient resiliency and redundancy across its range to maintain sufficient viability, despite variability in abundance.

(6) Comment: We received a comment from WDNR and several other commenters highlighting concerns over population declines since 2012 in the populations extant at the time of listing.

Response: At the time of listing in 1997, there were 10 known golden paintbrush populations in Washington and British Columbia, and the species was considered extirpated from Oregon. The SBR identified 48 populations established across the range of the species in 2018, including 26 populations established in Oregon (Service 2019, p. 11). The ten populations extant at the time of listing make up a small proportion of the current total abundance of this species established across its range. While many of the historical populations across the range of the species were likely extirpated due to land-use changes, such as development and agriculture, along with encroachment of trees and other woody plants, the persistence of these ten extant populations may be due to their protected locations that are not available for conversion for agriculture or development. Studies suggest that like other rare species, golden paintbrush may have been eliminated from the most suitable sites with the remaining extant populations relegated to marginal sites that did not provide

optimal habitat at the time of listing (Falk et al. 1996, p. 472; Dunwiddie and Martin 2016, p. 12). Sites with deeper soils and more moisture availability, along with a more diverse native plant community are more likely to support the species (Dunwiddie and Martin 2016, entire), and successful reintroduction to prairies in former agriculture lands with deeper soils have had great success (Delvin 2013, p. 7). Thirty-seven outplanted populations of golden paintbrush have been established and represent the majority of the abundance of the species across its historical range, including 26 populations in Oregon where the species was previously extirpated. These outplanted populations help to increase the resiliency, redundancy, and representation of the species and contribute to its viability. While the 10 sites extant at the time of listing remain and continue to contribute to the species' recovery, these sites likely do not represent the ideal site characteristics for the species. Although the 10 populations at the time of listing have exhibited decline, the efforts at outplanted sites across the range represent the recovery of golden paintbrush. For more information, see the discussion above on populations extant at the time of listing under *Range, Distribution, Abundance, and Trends of Golden Paintbrush*.

(7) *Comment:* We received several comments addressing the difficulties of establishing new populations, and highlighting the variability in seeding success, even on sites with established populations.

Response: We identified the difficulties in establishing new populations and the variability in seeding success in the SBR for golden paintbrush (Service 2019, p. 51) and took this into account in our determination. It is not uncommon to have failed reintroduction or introduction attempts for any species. For golden paintbrush, despite some outplanting failures, outplanted populations have been largely successful and represent the majority of the abundance of golden paintbrush across the range. Furthermore, in Oregon, where the species was previously extirpated, 26

populations have been established due to outplanting. Golden paintbrush continues to be outplanted by our partners at other conservation sites with the expectation of establishing even more populations across the species' range in the future.

(8) Comment: The WDNR and several other commenters disagreed that direct seeded populations may initially undergo a period of rapid growth followed by a period of decline to a more stabilized number. The commenters stated that it is unknown if population stabilization will occur.

Response: While there may be an initial period of rapid growth following an establishment period, population trends following a peak appear to vary greatly by site (Fertig 2021 pp. 24–27). After some large declines, several sites rangewide increased from 2019 to 2020, although not to the level of the initial spike in abundance. While some populations show a boom-bust population trend as was documented at some outplanted sites in Oregon (Kaye 2019, pp. 26–27), not all populations across the range are experiencing consistent decline. Rangewide abundance from 2017–2020 represent the four greatest abundances across all of the years monitored, including 25 sites that were not monitored in Oregon in 2020 (Fertig 2021, p. 22). As some commenters mentioned, the addition of seed to some of these populations complicates the assessment of population trends over time. Furthermore, population variability seen following the initial peak could be attributed to other impacts to the species from other stressors such as drought, herbivory, or competition from invasive species at the site level. Taken together, we find that the available information supports that while golden paintbrush populations may peak in abundance following initial establishment and may decline to lower levels, the pattern does not suggest a species-level decline overall rangewide. We will continue to monitor populations over 5 years using the post-delisting monitoring plan, which will

contribute data and increase our understanding of population dynamics and persistence over those years.

(9) *Comment:* The WDNR commented that there was no mention of the viability index developed by Dr. Tom Kaye for golden paintbrush in the proposed rule. In addition to providing us with 2019 and 2020 golden paintbrush survey data and their updated viability index for the species, the WDNR stated that as of 2020, 9 of 52 populations had a viability index score of 3, indicative of populations with positive growth over time, relatively stable numbers, and greater than 1,000 flowering individuals averaged over 5 years.

Response: The Service considered the viability index developed by Dr. Tom Kaye and summarized this information in the SBR which provides the best available information to inform our listing decision under the Act. In addition, in response to the information submitted by the WDNR, we re-calculated the viability index with data that include the most-recent survey year (either 2019 or 2020), since many sites were not surveyed in 2020. This resulted in 10 out of 46 populations having a score of three, an increase from the 6 out of 43 populations with a score of 3 identified in the SBR, indicating there are now more populations with high viability than what we identified in 2018. As we mentioned in the SBR, indices of this type are useful for synthesizing several pieces of information, but they can simplify or oversimplify available information. This index was intended to provide a broad evaluation of the species' population size and stability, and while these data were taken into consideration, they were considered along with the current condition analysis in the SBR. Additionally, we used updated survey data to evaluate the status relative to the recovery criteria (see **Recovery Criteria**, above).

(10) *Comment:* We received several comments (from WDNR and others) expressing concern over potential impacts of climate change on the species. We also

received several comments from WDNR and others highlighting WDNR's 2019 report updating an earlier climate change vulnerability assessment of golden paintbrush.

Response: In this final rule, we have incorporated the new information from the climate change vulnerability assessment (Kleinknecht et al. 2019, entire) and have added to our discussion on climate change. The Service reviews the best scientific and commercial information available when conducting a threats analysis. In considering what factors might constitute a threat, we look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing (or maintaining a currently listed species) on the Federal Lists of Endangered or Threatened Wildlife and Plants is appropriate. In determining whether a species meets the definition of a threatened or endangered species, we must evaluate all identified threats by considering the species' expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level, as well as the cumulative effect of the threats.

Drought, particularly in the spring and summer, likely impacts golden paintbrush populations, with potentially larger impacts on populations with low viability. Research conducted on microsite needs for the species suggested that deeper soils with high richness of native perennial forbs were more likely to support the species (Dunwiddie and Martin 2016, entire). Establishing populations can be difficult, particularly with annual variability in climate and drought seen in recent years, and as a result, multiple outplantings have failed. Despite this, seven new outplantings have been initiated since 2018 in Washington, including one on Protection Island. While it is difficult to assess the success of these outplantings due

to variable monitoring efforts in recent years, two have been noted as likely unsuccessful due to presence of nonnative weedy annuals, but the others show promise (Martin 2021, pp. 10, 23–25).

On a rangewide scale, the species demonstrates sufficient resiliency and representation to adapt to projected changes in climate. We have established 17 populations with a 5-year average of greater than 1,000 individuals over the species' range from British Columbia to Oregon, on sites representing environmental diversity consisting of wet and dry prairie, and valley foothills (Kaye 2019, p. 10). Total abundance was greater than 325,320 flowering plants across the range in 2019, and 288,699 in 2020 (excluding 25 populations that were not surveyed due to COVID restrictions); substituting 2019 data for populations not surveyed in 2020 yields an estimated abundance of greater than 370,000 flowering plants rangewide (Fertig 2021, p. 22). Despite drought seen in recent years, abundance of populations extant at the time of listing increased in 2020, and Washington populations reached their second-highest total abundance of 202,208 flowering plants, a 47.8 percent increase from 2019 (Fertig 2021, p. 11). Despite evidence of the potential effects of drought on golden paintbrush abundance in recent years (see Fertig 2021, p. 30; Martin 2021, p. 6), periods of drought have not been documented to consistently impact abundance across populations.

Regional climate change literature suggests that prairie ecosystems were established under warmer and drier conditions and are unlikely to be disadvantaged from future increased summer drought (Bachelet et al. 2011, p. 417). Golden paintbrush populations can experience high variability in abundance between years (Fertig 2021, pp. 24–27), and while climate change is a stressor, given the species' high abundance and distribution across the range from British Columbia to Oregon, golden paintbrush should have sufficient resiliency and redundancy to remain viable

into the future. Establishing plant species such as the golden paintbrush to populate the full geographic and climatic range of Pacific Northwest prairies has been identified as a “climate-smart” strategy (Bachelet et al. 2011, p. 420). The post-delisting monitoring plan will facilitate the evaluation of the species beyond delisting and detect unanticipated levels and/or extent of declines in abundance.

Since the publication of the proposed rule (86 FR 34695; June 30, 2021), we received an updated climate change vulnerability index (CCVI) report from our State partners at the WDNR’s Washington Natural Heritage Program (Kleinknecht et al. 2019, entire). This report was provided as a comment from WDNR. We evaluated the report and compared it to a similar assessment that was conducted in 2014 (Gamon 2014, entire). The CCVI was conducted using a NatureServe protocol, which relies on a species’ natural history, distribution, and landscape to inform whether and to what degree it will be impacted by climate change (Young et al. 2016, entire). In the 2019 report, golden paintbrush was ranked as “Highly Vulnerable” to climate change, a change from the 2014 report which ranked it as “Presumed Stable” (Kleinknecht et al. 2019, entire; Gamon 2014, entire).

While this 2019 CCVI report has helped inform our decision, it does not change our final determination. The 2019 assessment looked only at a small proportion of the species’ range. It assessed only a subset of sites from Washington, based on 22 native occurrences (11 extant and 11 extirpated or historical), not including the 10 outplanted sites in Washington or any of the populations in Oregon. The distribution of points used in the assessment were primarily in North Puget Sound, and given that half of these represent sites that have already undergone extirpation, this report is not necessarily representative of the potential impact on golden paintbrush across its currently occupied range.

Additionally, the guidelines for the CCVI describe that it works best for the scale from the size of a National Park to a State, and at larger scales may mask the vulnerability of local populations to climate change (Young et al. 2016, p. 9). Based on the larger scale of golden paintbrush's range, from Oregon to British Columbia, the CCVI method is not likely to be appropriate to assess climate change vulnerability.

(11) Comment: We received a comment from WDNR and several others expressing concern about the impacts of herbivory on golden paintbrush's viability. Commenters provided examples of impacts at specific sites, the difficulties in managing herbivory, and the potential impacts to seed production.

Response: Herbivory was noted as a threat at the time of listing in 1997, especially due to the limited number (10) of extant populations. Despite having a potential impact on abundance, a total of 48 golden paintbrush populations are now represented across the species' range in a variety of habitats and constitute a large geographic distribution contributing to the species' resiliency and redundancy, and to the species' ability to withstand stochastic events, including herbivory. Active, targeted management may be important in curtailing significant impacts, but it is not likely to occur across all sites at the same level, and it is not intended to result in the complete elimination of herbivory impacts on this species. Despite the recent examples of herbivory provided in the comments and anecdotal observations for specific sites and years, there are no consistent data linking herbivory to population declines, especially at the rangewide scale. Herbivory can vary by site, year, frequency, and level of impacts. Populations of the species will likely retain moderate to high levels of viability given the species' established redundancy across its range and the suitable condition of the habitat despite variable herbivory impacts; however, the post-delisting monitoring plan is designed to help track site-specific management

and potential impacts to species abundance for at least 5 years following delisting. For more information, please see the discussion of herbivory under **Summary of Biological Status and Threats**, above.

(12) Comment: We received a comment from WDNR and others expressing concern over potential impacts of hybridization to golden paintbrush, as well as expressing concern that the hybridization strategy and guidance document was not available for review during the June 30, 2021, proposed rule's public comment period.

Response: Hybridization is a potential threat to golden paintbrush that must continue to be managed, and we continue to work collaboratively with our partners to find solutions and management for sites that are already impacted by hybridization. Although a public commenter noted two sites on Whidbey Island as having potential hybridization impacts given a previous experimental study that seeded both paintbrush species, given low recruitment of harsh paintbrush at these sites, hybridization has never been identified by experts as a concern in those sites.

While the details of the hybridization strategy and guidance were not available during the June 30, 2021, proposed rule's public comment period, when the document was finalized, we organized a public roll-out where we presented details of the hybridization strategy and guidance, answered questions, and highlighted to our conservation partners that comments would be accepted to inform the next iteration of the document to make further improvements to the strategy. The document was posted on our website, and no comments were received. Solutions presented in the hybridization strategy and guidance document include, but are not limited to, preventing hybridization in other geographic areas, implementing a decision-making framework for new sites under consideration for paintbrush plantings, actively managing sites that are hybridized, and mapping the distribution of both golden and

harsh paintbrush. Through the MOU and hybridization strategy and guidance document, we and our State agency partners are committed to managing hybridization and working collaboratively with our other prairie conservation partners to ensure this potential threat is adequately managed after the delisting of golden paintbrush.

(13) Comment: We received a comment from WDNR and several others noting the lack of seed production at some populations in recent years (2019–2021), emphasizing the potential for declines given the species’ short-lived seed bank and the species’ reliance on bumble bees for pollination.

Response: Although we agree with the need to track and better understand the magnitude and extent of possible impacts of reduced seed production, based on the best available information, the observed reduced seed production at some sites does not appear to be resulting in notable demographic changes impacting the resiliency of golden paintbrush populations. Any decline in seed production could negatively impact a golden paintbrush population given its short-lived seedbank, and there are many unknowns associated with the potential effects of climate change on both golden paintbrush and pollinator communities. To date, however, there are uncertainties regarding the frequency, distribution, and scale of the lack of seed production, and uncertainty whether these represent short-term, isolated events or a large-scale change. Likewise, while golden paintbrush is reliant on bumble bees as its primary pollinator, it is unknown if pollinator decline is occurring across the range of golden paintbrush. Two bumble bees identified at the species level in the SBR, *Bombus vosnesenskii* and *B. bifarius*, were assessed as stable in the Pacific Northwest, and one bumble bee, *B. californicus* (sometimes recognized as *B. fervidus*), is less common in the Pacific Northwest than historically (Hatfield et al. 2021, pp. 15, 32, 72–73). However, the status and trends of these and other pollinators have not been evaluated in golden paintbrush populations. These

anecdotal observations present important information, yet it remains unclear how they translate to trends in population abundance over time and the scope of the impact across the species' range. We do not have information to conclude that these concerns are impacting the species to a degree that would result in the species meeting the Act's definition of either an endangered species or a threatened species. Post-delisting monitoring will enable us to monitor population abundance for at least 5 years after the species has been delisted.

(14) Comment: We received a comment from WDNR and several others expressing concern over the number of small populations (fewer than 100 individuals) and the small size of habitat occupied by golden paintbrush at some sites (less than 1 acre), suggesting that small populations and small patches of habitat should be eliminated from consideration regarding contribution towards recovery.

Response: We describe in the SBR that larger sites are likely better for population viability, as they allow for the development of larger populations and greater genetic diversity (Service 2019, pp. 35-36); however, there is no basis to remove populations existing on less than 1 acre or those with abundance of fewer than 100 individuals from our assessment of sites contributing to recovery. While small populations may inherently have a greater relative risk of extirpation than larger populations, that does not mean they cannot or do not contribute to species recovery. Site abundance is an important consideration with regard to the potential for the species to persist over time, and we used site abundance as part of our analysis of current condition in the SBR (Service 2019, p. 27). These data were incorporated into a population viability index as well as an assessment of current condition, which were both considered when evaluating whether the species needs protections under the Act. Habitat patch size was discussed in the SBR (Service 2019, pp. 35-38), and as noted, there are uncertainties regarding the importance of habitat patch size for populations

of golden paintbrush. The number of sites with more than 1,000 individuals and the wide distribution across the species' historical range will likely provide sufficient resiliency and redundancy to protect the species from stochastic events.

(15) Comment: We received multiple comments disagreeing with our evaluation of progress toward recovery criterion 2 and our assessment of the level of protection based on land ownership.

Response: In this final rule, we note that this criterion was not precisely met as stated in the recovery plan (see *Criterion 2 for Delisting*, above). However, a significantly greater number of populations under conservation-focused ownership provide protection to either the species or its habitat compared to the minimum number identified in the criterion; this will help the species retain sufficient viability into the future. Forty-five of the 48 golden paintbrush populations are in either public ownership; are owned by a conservation-oriented, nongovernmental organization; or are under conservation easement (Service 2019, p. 62). This number is much higher than the number (15) required to provide protection in the recovery plan's criterion 2. Such ownership is expected to protect sites from development and land use that would have long-term, wide-ranging deleterious effects on this species. Prairies are management-dependent habitats, and while habitat management will likely continue to occur across the majority of the sites, it will not necessarily occur to the same degree due to variations in capacity, need, or constraints across sites. We have developed a post-delisting monitoring plan to monitor abundance, site management, and the protection status of populations over at least 5 years following delisting.

(16) Comment: We received multiple comments expressing concern regarding the potential of recovery sites being shared between golden paintbrush and Taylor's checkerspot butterfly, given the threat of hybridization between golden paintbrush

and harsh paintbrush, the latter a common host plant for Taylor's checkerspot butterfly.

Response: Sites that support Taylor's checkerspot butterfly with harsh paintbrush will not be available to support golden paintbrush. However, there may be opportunities for Taylor's checkerspot butterfly and golden paintbrush to share sites, particularly if other host plants (in addition to golden paintbrush) are used, including English plantain (*Plantago lanceolata*). Likewise, sites in Oregon that have golden paintbrush and other host plants do support populations of Taylor's checkerspot butterfly. In this final rule, we address the fact that hybridization with harsh paintbrush has led to the abandonment of three recovery sites for golden paintbrush. Hybridization is a serious potential threat, and we have entered into an MOU concerning hybridization with our State partners (WDFW and WDNR) and created a hybridization strategy and guidance document to ensure the threat of hybridization with harsh paintbrush is managed and coordinated between partners into the future.

(17) Comment: We received several comments providing information on recent difficulties with seed availability at some sites, the potential impacts to nursery seed production, and challenges with seed production.

Response: These observations are concerning given the short-lived seedbank of the species; however, it remains unclear if the local, episodic events (due to herbivory or drought) represent a new long-term scenario with consistent impacts across the range of the species. Our post-delisting monitoring plan will direct efforts to track populations to help determine if these observations continue and whether or not there are broader impacts to golden paintbrush.

If populations of golden paintbrush decline below a certain threshold, seed collection from certain sites could prove difficult or inadvisable, and seed production for this species could be affected. Seed production efforts might need to be

supplemented by some outplanted populations that originated from the populations extant at the time of listing and could incorporate increased genetic diversity into nursery production (St. Clair et al. 2020, pp. 587–590). While a comment highlighted past difficulties in seed production for the species at a seed farm in Washington, seed production efforts across the range have been sufficient to support numerous outplantings that have contributed to the recovery of the species across its range. Currently, there are seed production programs at the Center for Natural Lands Management, along with smaller scale operations in North Puget Sound representing seed collected from the populations extant at the time of listing on Whidbey Island, the San Juan Islands, and South Puget Sound. New mixed-source beds for golden paintbrush have been recently established at the Center for Natural Lands Management and the Pacific Rim Institute, and we will continue to work with our partners to ensure that seed sources for this species remain available as long as considered necessary. These combined seed production efforts will continue to support ongoing establishment of new populations and augmentation of existing populations throughout the range of the species.

(18) Comment: We received a few comments describing historical habitat loss of Pacific Northwest prairies. We also received a comment discussing the importance of these rare habitats to Tribes from a public commenter unaffiliated with any Tribe.

Response: The rarity of prairies on the landscape presents challenges to conservation of prairie-dependent species, including golden paintbrush. Pacific Northwest prairies have experienced significant declines from their historical distribution due to habitat loss from development and agriculture, as well as changes in disturbance regimes and the maintenance provided by indigenous Tribes for thousands of years. While these comments were not submitted by a Tribe, we know the success of prairie-dependent species conservation is tied directly to the habitats

that support the species and to the extensive network of partners, including Tribes, working to restore and maintain prairies across the species' range;. These partnerships will continue to focus on restoration and maintenance of golden paintbrush and other species that rely on these rare prairie communities into the future. For more information, please see the discussion of habitat loss under **Summary of Biological Status and Threats**, above.

(19) Comment: We received a comment that disagrees with the information presented on genetic diversity in the June 30, 2021, proposed rule, stating that golden paintbrush has reduced genetic diversity because seed used to establish populations was sourced from seed from the populations extant at the time of listing.

Response: Genetic studies have indicated that despite its limited geographic range and isolation of its populations, golden paintbrush has high levels of diversity (Godt et al. 2005, p. 87; Lawrence and Kaye 2011, p. 173). Additionally, a recent study indicates that genetic diversity has increased in reintroduced populations relative to extant populations as a result of multiple source populations propagated together in a nursery production setting (St. Clair et al. 2020, pp. 589–591). Establishing populations across the species' range and in a variety of ecological settings will further contribute to the genetic diversity and representation of the species.

(20) Comment: We received a comment disagreeing with the established methodology of counting flowering plants to determine abundance estimates, The commenter stated that survey information could be unreliable due to the lack of non-flowering plant information.

Response: We developed the abundance estimate methodology in coordination with the golden paintbrush technical team to provide a consistent and reliable measure of adult plant abundance within populations to track population

status (Service 2007, p. 3). We and the technical team determined it was impractical to count non-flowering golden paintbrush plants, and recommended modifying Recovery Criterion 1 to specify a flowering plant metric (Service 2007, p. 3). Although counting flowering plants could mean that populations might actually be undercounted, because vegetative plants are not counted, flowering plant abundance better informs the number of individuals most likely to reproductively contribute to the population, and may also be the best method to estimate a reasonable minimum population size.

(21) Comment: We received multiple comments highlighting potential impacts on the golden paintbrush and its habitat from invasive plant species given projected warmer temperatures.

Response: Habitat loss has been considered a threat to the species since the time of listing (1997), and part of that consideration is focused on invasive species. While invasive species will always be a potential threat that will need adequate management, given the ongoing invasive species management commitments across the species' range, golden paintbrush is expected to maintain moderate to high viability. Many of the exotic species in the Pacific Northwest have wide distributions and are likely adaptable to climate change (Bachelet et al. 2011, p. 417). As commenters mentioned, there are ongoing studies focused on how to manage *Vulpia* ssp. (a winter annual grass) in South Puget Sound prairie communities that will provide valuable information on how to control this nonnative species within golden paintbrush habitat across its range. Management techniques are constantly evolving as new challenges arise from invasive species, climate change, and unforeseen circumstances. This progression in management will likely continue into the future; however, the level of success is not always certain. We developed a post-delisting

monitoring plan to track population status, site-specific management actions, and the presence of invasive species that will continue for at least 5 years following delisting.

(22) Comment: We received multiple comments expressing concern over the adequacy of the post-delisting monitoring plan to track the species' condition over the 5-year timeframe. The commenters suggest that estimating population size into categories (more than 1,000 flowering plants and more than 10,000 flowering plants) would be inadequate to detect changes in size and population trend and reduces the ability to understand why changes are occurring.

Response: The population size categories referenced in the post-delisting monitoring plan are not meant to be a population target but rather a threshold at which to review significance, methods, and potential threats with States and other collaborators before numbers might fall below the recovery objective. These thresholds are also consistent with those used in the SBR current condition analysis. Following delisting, the Act requires us to monitor effectively for not less than 5 years the status of the species in cooperation with the States that are within the range of the species (16 U.S.C. 1533(g)(1)). We developed a draft post-delisting monitoring plan for the golden paintbrush, coordinated review of the plan with State agencies in Washington and Oregon, and made the draft plan available for public review and comment. Sustaining post-delisting monitoring efforts can be challenging and subject to competing priorities for available resources. Nonetheless, we designed the post-delisting monitoring assuming limited resources. We are coordinating with State agencies in Washington and Oregon to find funding to support post-delisting monitoring efforts, but we fully anticipate some of the conservation landowners will continue to monitor populations on their own because of their ongoing interest in and commitment to conserving this species and others. We will continue to work with our

conservation partners to ensure implementation of an effective and feasible post-delisting monitoring plan for the golden paintbrush.

Determination of Golden Paintbrush's Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of “endangered species” or “threatened species.” The Act defines an “endangered species” as a species that is in danger of extinction throughout all or a significant portion of its range, and a “threatened species” as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of an endangered species or a threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find, based on the best available information, and as described in our analysis above, stressors identified at the time of listing and several additional potential stressors analyzed for this assessment do not affect golden paintbrush to a degree that causes it to be in danger of extinction either now or in the foreseeable future. Development of property for commercial, residential, and agricultural use (Factor A) has not occurred to the extent anticipated at the time of listing and is adequately managed; existing information indicates this condition is unlikely to change in the foreseeable future. Potential constriction of

habitat for expansion and refugia (Factor A) also has not occurred to the extent anticipated at the time of listing, and existing information indicates this condition is unlikely to change in the foreseeable future. Habitat modification through succession of prairie and grassland habitats to shrub and forest lands (Factor A) is adequately managed, and existing information indicates this condition is unlikely to change in the foreseeable future. Recreational picking and associated trampling (Factor B) has not occurred to the extent anticipated at the time of listing; the species appears to tolerate current levels of this activity, and existing information indicates that this condition is unlikely to change in the foreseeable future. Herbivory on plants and seeds (Factor C) has not occurred to the extent anticipated at the time of listing; the species appears to tolerate current levels of herbivory, and existing information indicates that this condition is unlikely to change in the foreseeable future. Hybridization with the harsh paintbrush (Factor E) is adequately managed, and existing information indicates this condition is unlikely to change in the foreseeable future. Finally, golden paintbrush appears to adequately tolerate the effects of climate change (Factor E), and existing information indicates that this tolerance is unlikely to substantially change in the foreseeable future. In addition, there are means to help further mitigate for those effects of climate change (e.g., continued outplanting across varied site conditions). The existing regulatory mechanisms (Factor D) are sufficient to ensure protection of the species at the reduced levels of threat that remain.

Thus, after assessing the best available information, we determine that golden paintbrush is not in danger of extinction, nor likely to become so in the foreseeable future, throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future

throughout all or a significant portion of its range. Having determined that the golden paintbrush is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we now consider whether it may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range—that is, whether there is any portion of the species’ range for which both (1) the portion is significant; and (2) the species is in danger of extinction now or likely to become so in the foreseeable future in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the “status” question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species’ range.

In undertaking this analysis for the golden paintbrush, we choose to evaluate the status question first. We began by identifying portions of the range where the biological status of the species may be different from its biological status elsewhere in its range. For this purpose, we considered information pertaining to the geographic distribution of (a) individuals of the species, (b) the threats that the species faces, and (c) the resiliency condition of populations.

For the golden paintbrush, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species’ range such that the species is in danger of extinction now or likely to become so in the foreseeable future in that portion. We examined the following threats: (1) Habitat succession of prairie and grassland habitats to shrub and forest due to fire suppression, interspecific competition, and invasive species; (2) development of property for commercial, residential, and agricultural use; (3) low potential for expansion and refugia due to constriction of habitat by surrounding development or

land use; (4) recreational picking (including associated trampling); (5) herbivory (on plants and seeds); (6) hybridization with harsh paintbrush; and (7) the effects of climate change, including cumulative effects. Although the impact of hybridization with the harsh paintbrush is most evident in the South Puget Sound region of the species' range, this impact was due to the unintended consequences of seeding harsh paintbrush in aid of another species, so as a potential stressor, it is being addressed throughout the species' range with the hybridization strategy and guidance. We found no biologically meaningful portion of the golden paintbrush' range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range, or where the condition of the species differs from its condition elsewhere in its range such that the status of the species in that portion differs from its status in any other portion of the species' range.

Therefore, we find that the species is not in danger of extinction now or likely to become so in the foreseeable future in any significant portion of its range. This does not conflict with the courts' holdings in *Desert Survivors v. Department of the Interior*, 336 F. Supp. 3d 1131 (N.D. Cal. 2018), and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d. 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014), including the definition of "significant" that those court decisions held to be invalid.

Determination of Status

Our review of the best available scientific and commercial information indicates that the golden paintbrush does not meet the definition of an endangered species or a threatened species in accordance with sections 3(6) and 3(20) of the Act.

Therefore, we remove the golden paintbrush from the List of Endangered and Threatened Plants.

Effects of the Rule

This final rule revises 50 CFR 17.12(h) by removing the golden paintbrush from the List of Endangered and Threatened Plants. On the effective date of this rule (see **DATES**, above), the prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, no longer apply to the golden paintbrush. Federal agencies will not be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect the golden paintbrush. There is no critical habitat designated for this species, so there is no effect to 50 CFR 17.96.

Post-delisting Monitoring

Section 4(g)(1) of the Act requires us, in cooperation with the States, to implement a system to monitor effectively, for not less than 5 years, all species that have been recovered and delisted. Post-delisting monitoring (PDM) refers to activities undertaken to verify that a species delisted due to recovery remains secure from the risk of extinction after the protections of the Act no longer apply. The primary goal of PDM is to monitor the species to ensure that its status does not deteriorate, and if a decline is detected, to take measures to halt the decline so that proposing it as endangered or threatened again is not needed. The monitoring is designed to detect the failure of any delisted species to sustain itself without the protective measures provided by the Act. If, at any time during the monitoring period, data indicate that the protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing under section 4(b)(7) of the Act. Section 4(g) of the Act explicitly requires us to cooperate with the States in development and implementation of post-delisting monitoring programs, but we

remain responsible for compliance with section 4(g) and, therefore, must remain actively engaged in all phases of post-delisting monitoring. We also seek active participation of other entities that are expected to assume responsibilities for the species' conservation post-delisting.

We prepared a PDM plan that describes the methods for monitoring the species after its delisting. Monitoring of flowering plants at each golden paintbrush site extant in 2018 will take place every other year, over a minimum of 5 years, beginning the first spring after the effective date of this final delisting rule (see **DATES**, above). Monitoring efforts will be slightly modified from prior protocols, by only requiring a visual estimation of population size when the population clearly exceeds 1,000 flowering individuals but is fewer than 10,000, or when a population clearly exceeds 10,000 flowering individuals as opposed to an actual count or calculated estimate of flowering plants. This modification should streamline monitoring efforts. It is our intent to work with our partners to maintain the recovered status of golden paintbrush. The final PDM plan can be found at <https://www.regulations.gov> under Docket No. FWS-R1-ES-2020-0060.

Required Determinations

National Environmental Policy Act

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, environmental analyses pursuant to the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) need not be prepared in connection with determining a species' listing status under the Endangered Species Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretary's Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Native American culture, and to make information available to Tribes.

We do not believe that any Tribes will be affected by this rule, and we did not receive any comments on our June 30, 2021, proposed rule from a Tribe. There are currently no golden paintbrush sites on Tribal lands, although some sites may lie within the usual and accustomed places for Tribal collection and gathering of resources.

References Cited

A complete list of all references cited in this rule is available on the internet at <https://www.regulations.gov> at Docket No. FWS-R1-ES-2020-0060, or upon request from the State Supervisor, Washington Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff of the Washington Fish and Wildlife Office in coordination with the Pacific Regional Office in Portland, Oregon.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Plants, Reporting and recordkeeping requirements, Transportation, Wildlife.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

§ 17.12 [Amended]

2. In § 17.12, in paragraph (h), amend the List of Endangered and Threatened Plants by removing the entry for “*Castilleja levisecta*” under FLOWERING PLANTS.

Martha Williams,
Director,
U.S. Fish and Wildlife Service.

[FR Doc. 2023-14971 Filed: 7/18/2023 8:45 am; Publication Date: 7/19/2023]